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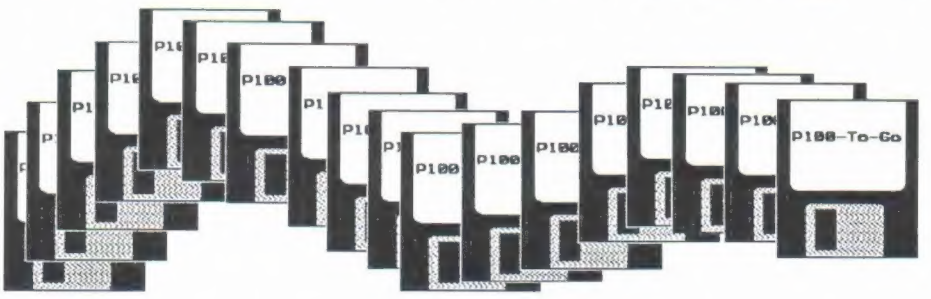

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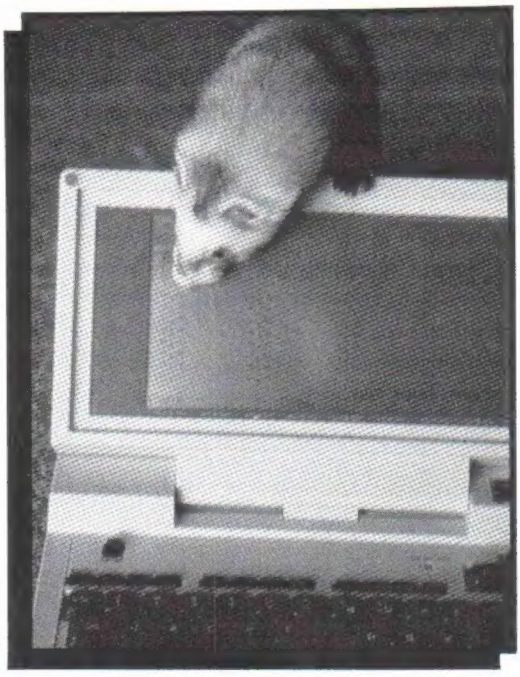
Chips-To-Go: ***Chipmunk owners—Club 100 will convert your*** **P100-To-Go disk** ***to Chipmunk format. Send your original*** **P100-To-Go** ***disk, with $5.00 plus First Class return postage, to Club 100,*** **Chips-To-Go,** ***P.O. Box 23438, Pleasant Hill, CA 94523.***

VOL. 6, NO. 2
February 1989

ON THE COVER:
Photo thanks to Ben Viljoen of Gordon's Bay, Republic of South Africa, who has found a new way to ferret out glitches.



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We all want to be the center of attention, but sometimes it has drawbacks ...

Tandy 102

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A NOTEBOOK DATABASE 14
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The popular text print formatter is now available for the Tandy 200!

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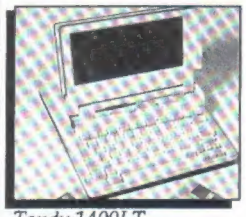
LPTCOM: REDIRECT LPT I/O TO COM PORT 24
by Stanley Wong
Use your serial printer as if it were a parallel printer (Tandy 100 and 102 only).

FAST AND INSIDE: THE ATD MODEM 27
by Mike "On Holiday" Nugent
A high-speed (2400-baud) modem for your Tandy 1400LT.


Tandy 1400LT

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ROM WITH A VIEW

Although the cover date on this issue says February, it's actually December here. Mike, who usually writes these communiques, is on vacation, and I get a chance to put in my two cents.

Things are hopping up here in Peterborough. In case you haven't heard yet, *Pico* is now a thing of the past. We closed it down just a couple of weeks ago, for a variety of reasons. Fortunately, none of those reasons have any bearing on *Portable 100*, so we will continue to send out issues every month (except for our combined July/August issue, of course). That should finally put to rest all those rumors that we were going to merge the two magazines or convert *Portable 100* to an MS-DOS magazine.

A year's worth of effort is finally starting to pay off for both us and for you, the reader. We're starting to see more and more companies returning to the fold, after seeing that we were serious about publishing *Portable 100* and weren't going to disappear at the first sign of trouble. You'll start to see some of these new companies in the coming months, as well as many new products developed just for the Tandy portable computers.

Our mail list deal with Tandy is also starting to show dividends: our mailing to 25,000 Tandy portable computer owners is picking up ten times as many new subscriptions as expected. In addition, Tandy's new policy of asking new portable computer purchasers if they would like a free copy of *Portable 100* is raking in curious prospects (Tandy Fort Worth told us a batch of 800 names would be sent to us a few days after Christmas, up from 126 in November). Advertisers should take note of this, as not everyone who receives a free issue will actually subscribe. For those people, you only get one shot. Advertising every other month, or less frequently, means you miss your only shot at some of these potential buyers. And I won't even mention our new, complete, list of *Tandy Computer Center* and *Radio Shack Plus Computer Center* store addresses.

You'll also notice that we managed to get more articles in this issue than the last one. We'll try real hard to keep that up. As we start to add more advertisers, we'll start to add more pages. If you know of people who have products for any of the Tandy portables, tell them about us (and us about them) and we'll see about getting them into the magazine so others can read about their products.

Club 100, one of our advertisers in the *Classified Ad* section, has generously offered to help out all those people who own Chipmunk disk drives and not TPDD's. For the small sum of $5.00 (plus postage) they will convert your *P100-To-Go* disk to a *Chips-To-Go* disk readable by your Chipmunk disk drive. The procedure is easy: Buy your *P100-To-Go* disk from us; when the disk arrives, mail it, $5.00, and return postage to *Club 100, Chips-To-Go*, P.O. Box 23438, Pleasant Hill, CA 94523; and wait for your *Chips-To-Go* disk to arrive.

Finally, starting with the January *P100-To-Go* disks will be a column written by Richard Hanson, president of *Club 100*. What it will be about is anybody's guess at this point (Rick said he would surprise us!). Hope ya'll like it.

-Terry Kepner

Toolbox

Manuscripts were typed into Microsoft Word 3.0 on a Tandy 1400 LT, where they were edited, spell-checked, and had basic format instructions inserted. From there they were loaded into a Tandy 4000 (80386 CPU, Tandy EGA Monitor, Tandy LP-1000 LaserPrinter) desktop computer and placed into Aldus' IBM PageMaker 2.0a. There they were put into a rough approximation of the magazine's final appearance. Here, pull quotes are placed, headlines, intros, and bylines are sized and positioned, and advertisements positioned.

Next, the magazine was ported over to our Art Director's Macintosh II, using the 1400 LT and Mac-link. She then went over the publication using Aldus Macintosh PageMaker 3.01, making final design decisions on photo, figure, and listing sizes and placements. She precisely placed the text and added all the little things that go into making a nice looking publication.

Page previews were output from her Laserprinter. When everyone was satisfied with the appearance, the Macintosh disk was sent to Colorite Corp. in Wisconsin for final output directly onto photographic paper. The finished magazine was then delivered to the printer, who printed it, labeled it, and mailed it to you.

portable 100

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VOLUNTEERS NEED M100'S

Do you have a used Radio Shack Model 100 which you no longer use or need? Volunteer workers in Papua New Guinea can use it. A couple hundred M100's are currently being used by translators in Papua New Guinea by nationals and expats *[expatriates]* to help in recording the translation of the more than 700 separate languages of this country. These workers are not paid by the governments but are individuals performing this work on faith. Any units you ship to me, I will ship to Papua New Guinea, where technically competent personnel will use the parts from them to maintain their present M100's. If a unit you send to me can be repaired, they will add this to their usable units. All units will be shipped to PNG. No units will be resold in the USA.

Robert N. Knox
RFD #1, P.O. Box 140
New Hampton, NH 03256
(603)744-5160

My geography is a bit rusty, so I looked it up. Papua New Guinea is just northeast of Australia. If anybody wants to pick up the airfare, I'll be happy to deliver any donated machines personally!

-MN

LONELY NO MORE

In "Ending Your Computer's Solitude" (September '88) I ducked the question of the pinout for the IBM PC-AT 9-pin serial port. The missing info (and just about anything else you'd like to know) is shown in *The PC Technical Source-Book*, $9.95, from Industrial Computer Source; 5466 Complex St., Suite 208; San Diego, CA 92123. Their phone is (619)279-0084, Ext. 50.

Here are the connections for a null modem cable from the M100's female DB25 RS-232C port to an AT's male DB9 RS-232C port. (See Table 1, p. 5) With this information, owners of newer MS-DOS boxes should be able to make the cable described in the article.

Mike, you're good for the M100 community and *Portable 100*—keep up the super work. Maybe we'll all live through it!

David O. Rowell
Marietta, NY

Thanks, David! That'll sure help some folks get hooked up. We're looking forward to your upcoming review of the various DOS's (disk operating systems) for the Model 100 family. And your last paragraph just made my day! (Hey, Mom and Dad, did you see that?!)

-MN

6-PACK WITH CHIPS?

First of all, let me congratulate you on the continuing improvement in the editorial content of your magazine. The November '88 issue was, to me, the most useful yet. The forms and envelope printing programs are quite useful. And I am now ready to use *TELCOM*, which I have always viewed with much trepidation!

Also, I was quite happy to see your ad for the *P100-To-Go* monthly program disks. Then I was dismayed to see you don't offer Chipmunk-formatted disks. I'm not about to shell out the money for a Tandy disk drive, since I'm quite happy with my Chipmunk and quite frankly believe I'd be backstepping in technology to buy one. With all your staff's years with the Tandy 100, you MUST have some Chipmunks around to dupe with!

David A. Jones
Westerville, OH

Our Chipmunk ran away, David. (Actually, we lent it out, and it hasn't returned.) Even if we had one "squirreled" away somewhere, we have neither the staff nor resources to provide 'Chips-To-Go disks. But Club 100 has agreed to convert P100-To-Go *disks to Chipmunk format. For details, see the ad on page 1.*

By the way, having heard recently that Holmes would still sell Chipmunk drives for Tandy computers, I checked it out. The company president said demand was insufficient to warrant making them, but if enough people write letters asking for Chipmunks, Holmes might consider resuming production. If that sounds good to you, place your cursor over TEXT, *press* ENTER, *and start typing. Send your hardcopy to Holmes Microsystems, Inc.; 2620 South 900 West; Salt Lake City, UT 84119. Telephone number is (801)975-9929.*

-MN

If enough people write letters asking for Chipmunks, Holmes might consider resuming production.

YO, MO!

I appreciate your light-hearted approach to your work. I also appreciate the more technical information supplied by articles such as Mo Budlong's recent offering. Keep it coming!

Tim Palmquist
Portable BBS
Message to SYSOP

THE WORLD'S FIRST MAGAZINE VIRUS.

1. Follow the instructions on this page.
2. Photocopy this coupon.
3. Paste it to the following page of this magazine.
4. Go to 1.

(A mutation of an original virus by Jerry Lazar in *Computer Systems News*, a weekly newspaper, November 21, 1988, page 70.)

```
Pin on the DB25 connects to Pin on the DB9

2 TR, transmit data ....2 RX, receive data
3 RD, receive data .....3 TX, transmit data
7 GND, signal ground ...5 GND

On the DB25 jumper pins 4 and 5.
On the DB25 jumper pins 6, 8, and 20.
On the DB9 jumper pins 7 (RTS) and 8 (CTS).
On the DB9 jumper pins 6 (DSR), 1 (DCD), and 4
  (DTR).

Radio Shack's part numbers are 276-1538 for a DB9
female connector, 276-1537 for a DB9 male connec-
tor, and 276-1539 for a hood for either connector.
```

Table 1. Connections to make a null modem cable from the Model 100 to the IBM PC-AT or similar computers.

EVEN MO' MO!

I enjoyed the December issue, particularly the article about moving to and from *TEXT* from *BASIC*. Keep the technical articles coming in *Portable 100*! I called King Computer Services to find out about their cross compilers. Information like that in your articles and advertisements is invaluable!

Tracy Allen
Portable BBS
Message to SYSOP

Mo Budlong's article "Calling TEXT *from* BASIC" *has generated quite a bit of interest. I suspect we'll be seeing some program/article submissions that use the techniques he described. Personally, I envision some sort of* BASIC *"front end" program that lets you access your* NOTE.DO, ADRS.DO, *and other* TEXT *files, tying them all together as a sort of personal information management system. It'll be interesting to see what others come up with!*

-MN

THE CUSTOM 100?

As a subscriber to *Portable 100* since 1986, I have been delighted with the new management and the new look!

Recently, you've featured a number of articles ("Displaying Three Banks at Once"—May, "Cross-Bank Pasting"—July, and "Cross-Bank *TELCOM*"—October) for the Tandy 200.

I have a Model 100 with the 96K board and *RAM+* chip produced by American Cryptronics and formerly marketed by PCSG, and I wonder whether there is a way to modify these T200 programs to work on my M100.

If I were a true "hacker," I'd have already tried to modify the program using the conversion table in the May 1986 issue, but since I'm not, I haven't! Thanks for any help you can suggest.

Charles Cooper
New Hope, PA

Well, Charles, your city's name is certainly appropriate. I've been talking with American Cryptronics and Paul Globman about doing such a thing. Since the M100 handles the warm reset sequence differently, a straight conversion of T200 code won't work. My previous experiments with M100 low-memory techniques showed some promise, but many obstacles remain. So we're looking into it, but NO PROMISES, okay?

-MN

PUZZLE.100 *is on this month's disk and will be on the BBS by the time you read this.*

ANOTHER BUG FIX

John Neufeldt's *DATCHK.BA* program (November '88 *I/O*) provides much-needed notice that the Model 100/102's notorious date bug has advanced the calendar year. Here's an alternative program, *BUGFIX.BA*, that's only 28 bytes long and automatically re-sets the date without operator attention or manual input. Run it as your IPL program, or add it to the top of any frequently-used utility. Just be sure to update the year (in quotes at the end of the line) every Jan. 1.

```
10 DATE$=LEFT$(DATE$,6)+"89"
```

Dan Drasin
Oakland, CA

Dan is the author of "CPR for Your Laptop: Reviving a Downed System" (July '86), "an indispensable, don't-leave-home-without-it compendium of lifesaving information." Thanks, Dan!

-MN

PUZZLED.100

I am a long-time subscriber and love your magazine. I am intrigued by the *PUZZLE.BA* program published in the December '88 issue. I do not have a Tandy 200, nor do I know how to change the program to run on my Model 100. (Obviously, there is a Model 100 version, since it is available on CompuServe, which I cannot access.) Please send me a printout of the Model 100 version.

J.R. Hankey
Annandale, VA

Ordinarily, we can't mail printouts of programs. But we do make them available on P100-To-Go *disks and the* Portable BBS. PUZZLE.100 *is on this month's disk and will be on the BBS by the time you read this. To access CompuServe, just sign up. Call (800)848-8199 to learn how, or get a sign-up kit at Radio Shack, Waldenbooks, B. Dalton, or Computerland. There's a wealth of programs available on-line, just for the taking. It's easy to do and well worth it.*

Now call me a sentimental fool, J.R., but since your first name is the same as my middle initial, I've sent you a printout anyway. (But just this once!)

-MJN

STAND UP AND BE COUNTED

To the person who asked about the *Safe* multi-ROM. When I phoned P.G. Design, I was told that they had (understandably) received a lot of inquiries after Michael Heim's article in *P100*, and they would resume production if there is "enough demand." So, let's get those "cards and letters" in! We 200'ers must stick together!

Will Linden
CompuServe EasyPlex

After reading the article by Michael Heim, Ph.D, I was inspired to give my trusty Tandy 200 that giant leap of RAM. I first called Node Systems, Inc. at (916)477-6706 and learned that the 256K Datapac for the Tandy 200 is still avail-

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Circle 121 on reader service card.

able but that it requires the use of the ROM socket for its controller ROM.

As I am dependent on my *Super ROM*, I then called P.G. Design at (313)727-2744 and was informed that they do not make the 8-ROM expansion pack anymore!!! It was identical to the product Traveling Software marketed. I told them about the article and told them that they would be getting a lot of calls requesting it.

I called them later that day, and they took my name, address, and phone number, and told me that they will do the same with everyone else who calls, and if there are more than 100 requests, they will manufacture more and sell them at the original $129 price.

CAN WE DO IT? LET'S TRY!!

David A. Mantel
Potomac, MD

TAMING THE 200

In the December '88 issue I found what may well have been an answer to every Tandy 200 owner's dream. Dr. Heim's article, "Taming the 200," seems to be a means for expanding the "puny" memory of the T200 to 256K.

I am wondering if the Tandy Portable Disk Drive would still be usable to store, install, or reinstall programs that aren't necessary to keep on a permanent basis in the Node Datapac. It seems that Dr. Heim's souped-up 200 is just the thing for us to have for long trips. I am wondering, however, whether, by use of an external modem, we would be able to download larger programs. Dr. Heim might also have come up with a means of reducing a piece of equipment that would be exceptionally attractive.

In keeping with some of the other comments in the December '88 issue, I have written to the vendors mentioned in Dr. Heim's article and made specific reference to learning about their items in *Portable 100* magazine. Perhaps if they know there are people finding out about their product in *Portable 100*, they might even be a little more interested in advertising.

Keep up the good work. I love *Portable 100* magazine and the *Portable Bulletin Board*.

Anthony J. Sestric
St. Louis, MO

Sure, you can store files on disk and move them in and out of the Datapac. Just copy a file into RAM and then move it to disk or Datapac as desired.

To the best of my knowledge, you're still limited to downloading files only as large as available RAM. Only a program that downloads directly to the Datapac will let you take on larger files. Such a program might exist, and if so, I'm sure we'll hear about it after this issue hits the streets.

And thanks for writing to the vendors. That's how they gauge the demand for their products and the value of Portable 100 *advertising. It helps them, us, you, and your fellow users. You're a good guy, Anthony J. Sestric!*

-MN

If there are more than 100 requests, they will manufacture more and sell them at the original $129 price.

TAMING THE TAMER

I enjoyed reading Michael Heim's article "Taming the 200" in the December issue. I was troubled by the fact that banks #2 and #3 had to be removed to eliminate cold starts. I would like to share with your readers (and Michael) a detailed explanation of what is causing the problem and how to avoid it without removing the additional RAM banks.

After accessing the Node ROM and returning to the menu, the RST 7 keyscan hook is left engaged, thereby accessing the Node ROM with every keyscan. So when you switch RAM banks, the bank you leave has its hooks set so that keyscans are checked by the option ROM.

Now in another bank you use the P.G. Design *Safe* (8-ROM expansion) to switch ROM's, to use *Super ROM* or whatever. If you forget to switch back to the Node ROM, then as soon as you re-enter the first RAM bank (whose keyscan hook calls the option ROM) the keyscan routine accesses *Super ROM* instead of the expected Node ROM. This is one cause of the cold starts.

Whenever the T200 is first powered on, bank #1 is examined. If you were using *Super ROM* in bank #2 or #3 when the T200 was powered off, and with the hook in bank #1 expecting the Node upon power-on, you have another cause of cold starts.

Can they be prevented? Yes. Either always switch to the Node ROM before switching RAM banks (and never access Node from bank #1), or...

Install *XOS* (Cross-bank Operating System) and only access option ROM's via *XOS*'s *F3 (Roms)*. *XOS* is currently available on CompuServe and will soon be published in "The Custom 200" in *Portable 100*.

Paul Globman
Sunrise, FL

?IO—CORRECTIONS

Mike, in your second article on the GoldCard, when you told how to IPL getting into Gold Card or *GoldText*, there was an error in the *BASIC*: the program should read: *IPL "CHR$(31)+CHR$(28)"* (i.e., one step down, one right). At least, that works for me!

Incidentally, I am so happy to have *Portable 100* magazine; my December issue arrived today with the answer to hooking up my 100 and PC: somehow the link I had established through a null modem has failed me and I had forgotten how to do the modem-modem hookup. Tom Wagner's letter reminded me.

Don Hinkle
CompuServe EasyPlex

Right you are, Don! 'Twas a typo, and we missed it. Thanks!

-MN

We welcome all letters from our readers, whether critical or complimentary. We print as many letters as space permits (some are edited for space considerations). Address your correspondence to: Portable 100, I/O Dept., P.O. Box 428, Peterborough, NH 03458-0428.

M 100/KC-85 COMPATIBILITY

I have had several calls concerning my note on Model 100/Kyotronic 85 ROM compatibility (November '88) from individuals who have been unable to duplicate my results. Here is why:

The *TRS-80 Model 100 Technical Reference Manual* shows that both the standard ROM (M12) and the option ROM (M11) have a non-JEDEC, proprietary, pinout. The *Kyotronic KC-85 Service Manual* shows that, while the option ROM (M11) is non-standard, the standard ROM (M12) has the standard JEDEC pinout; i.e., it is 27C256 compatible.

My Model 100 is an early model (S.N. 307018102), and its standard ROM socket pinout is the same as that of the KC-85, i.e., 27C256 compatible. Apparently, a design change was made, by or for Tandy, between production runs of the Model 100 to remove the compatibility. The intent may have been to reduce ROM "piracy," in the same way that Apple II ROM's had the CS polarity inverted from that of the corresponding EPROM's. This did not totally eliminate unauthorized Apple II ROM duplication, since hardware "hackers" soon discovered that inverted CS signals could be supplied to the EPROM in a very simply modified socket. (It is a variation of this same approach, using an adapter "harness," which permits using 27C256 EPROM's in the option ROM socket.)

My Model 100 ROM bore the markings *3256C07-3G1 / 11US / ©1983 / MICROSOFT*. This ROM has the JEDEC pinout. I was fortunate, in that this ROM could be used directly in the KC-85, and could be read, and 27C256-modified copies made, in standard PROMmers. Later versions of the ROM are NOT readable in standard PROMmers, , but may be read in a pin-transposing gimmick socket. Any modified 27C256 copies will need an adapter gimmick for use in the Model 100, but can be used as in the KC-85.

Dr. H. R. Luxenberg
Chico, CA

A MODEM HANGUP

This summer I wanted to use the Model 100 for remote data collection and control by interfacing the 100 to an electronic mail system. I quickly identified that any one program in a Model 100 can use the RS-232 port OR the modem, but not both in a single *BASIC* program.

The symptoms were that after using the RS-232 port and then going to the modem the relay, RY1, that seizes the telephone line and dials the digits, will "open" for about 1 second immediately after dialing the last digit. The telephone system simply senses that 1-second open and drops the call.

After some long discussions with our friends in Tandy Corp. the following fix was provided to allow both the RS-232 and modem features to be used in a single *BASIC* program.

```
50100  PH$ = P1$ + "<==!.^M?:=" + P2$ + "^M??=" + P3$ +
"^M??=" + P4$ + "^M=>"
50110  M=VARPTR(PH$)
50120  AD=PEEK(M+1)+(PEEK(M+2)*256)
50130  CALL 21200
50140  POKE 63067,ASC("M")
50150  CALL 21293,0,AD
```

The new addition is line 50140. The effect is to prevent a form of reset action on the 82C55 used in the Model 100. With this addition, used before each modem access, data can be collected via the RS-232 inputs and control functions done with the RS-232 outputs as well as the serial in/out used under *BASIC* program control while also allowing the modem to be used by the same *BASIC* program.

Larry Kayser
Ottawa, Ontario

BOOSTER PAK DIRECTORIES

The following program will maintain a directory list (*DIRLST.DO*) in the root directory of the Booster Pak. This list will contain all the directories with their associated environments and files. (Refer to listing at left.)

Paul Globman
Sunrise, FL

❑

```
0 REM DRCTRY.BA by Paul Globman, copyrig
ht (c) 1988
1 CLS
2 LCD=65024
3 LFILES"ROOT"
4 OPEN"R:DIRLST"FOROUTPUTAS1
5 PRINT#1,"<ROOT DIRECTORY> "DAY$" "DATE
$"  "TIME$
6 CLOSE
7 GOSUB21
8 OPEN"R:DIRLST"FORINPUTAS1
9 LINE INPUT#1,D$(1)
10 FORI=1TO10:D$(I)=INPUT$(10,1):NEXT:CL
OSE:FORII=1TO10:IFRIGHT$(D$(II),4)<>".<>
 "THENMENU
11 D$=LEFT$(D$(II),6)
12 KB$="CLS:LFILES"+CHR$(34)+D$+CHR$(34)
+":CONT"+CHR$(13)
13 BUF=65451
14 FORJ=1TOLEN(KB$)
15 C=ASC(MID$(KB$,J,1))
16 POKEBUF+(J-1)*2,C
17 POKEBUF+1+(J-1)*2,32
18 NEXTJ
19 POKEBUF-1,LEN(KB$)
20 STOP:PRINT@0,D$:GOSUB21:NEXTII:MENU
21 OPEN"R:/ROOT/DIRLST"FORAPPENDAS1
22 FORI=0TO319
23 PRINT#1,CHR$(PEEK(LCD+I));
24 NEXTI
25 CLOSE
26 RETURN
```

Forum is where you can show off your expertise and help your fellow readers! Address your tips, hints, and techniques to: Portable 100, Forum Dept., P.O. Box 428, Peterborough, NH 03458-0428.

The Model 102 Outstanding in its Field

Agripro and Jacobsen Holz use 102's to collect data for agricultural research.

by John Jacobsen

You might not expect to find a laptop computer in the middle of an Iowa alfalfa field mounted on a noisy, dirty, harvesting machine, but a group of researchers at Agripro, a major U.S. seed company, have found it to be a blessing. Located at a research station in the central part of Iowa, these researchers are in the business of growing alfalfa, lots of alfalfa. And they study it from the time it is planted in their nurseries through the time it is harvested in the fields, occurring several times each year. Just at this research station alone several thousand alfalfa plots are studied every year, which results in an enormous amount of data to collect. Researchers use this data to determine which plant varieties produce the highest yield. And these high-yielders are eventually grown in large quantities to produce seed for marketing to the farm community.

The collected data consists of either a value score or an actual measurement of a particular plant attribute. Such an attribute is called a *trait*. A trait can be any number of items that the researchers study to give them tangible information regarding the growing ability of a plant variety. Researchers study plant height, various degrees of plant vigor, color, disease resistances, harvested weight and many more traits. Although Agripro has used computers for years to aid in the analysis of their data, in the past they have collected it manually by writing the information in notebooks and later typing it into the computer.

The new system reduced the labor from six people to one.

When Jim Moutray and Wayne Hartman, two researchers at the mid Iowa Agripro research station, decided to improve their data collection techniques, they needed a system that would be flexible enough to handle several alfalfa research duties and as well as useful to other research divisions studying other plants such as corn, soybeans, and wheat. They also recognized that electronic data collection would reduce the total work hours in collecting data, especially with the alfalfa harvester. Before this system would be integrated into the harvester, six people were needed during each harvest. One person would drive the harvester, four people would catch the alfalfa in bags as it was being harvested, and one person would weigh it and record the measurement. The new system reduced the labor from six people to one and also resulted in improved consistency and accuracy in the data.

Researchers at Agripro, a major seed company, in conjunction with the Jacobsen Holz Corporation, use a Model 102 housed in a briefcase and attached to a mechanical harvester to collect needed data.

THE ANSWER

Agripro reviewed several different computers before choosing the Tandy 102 as their company data collection computer. For one, the large screen was appealing because it could display more information than, for example, a hand-held computer with the standard 16-digit, two-line display. The standard QWERTY keyboard was also a plus in their eyes. Since the data would be transferred to their DEC computer, and often from remote locations, the built-in modem was a must. Now, with many other laptops touting these features the Tandy had one particular feature that could not be beaten, and that was the price. The Tandy proved to be the most economical system of all the computers evaluated and provided Agripro the power and handling ease they were looking for. The only drawback to the Tandy was the limited memory resident in the computer, but they resolved this problem by installing an after-market memory expansion unit. After trying a couple different units, they chose the Booster Pak, a memory expansion device that snaps onto the

Mounted to reduce vibration, the Model 102 shares space with a 40-column Star dot-matrix printer, as well as an analog-to-digital converter that converts the weight of the crops to computer data.

bottom of the Tandy 100 or 102.

Agripro also contacted the Jacobsen Holz Corporation (JHC), also located in central Iowa, developers of custom software and custom hardware for electronic systems, having several years experience with agricultural research and data collection. JHC was contracted to write the needed software, design the custom data collection hardware, and make the needed mechanical modifications to the alfalfa harvester. The result was the development of a computerized data collection system contained in a briefcase that can easily be mounted on the alfalfa harvester for electronic collection of the weight of the cut alfalfa. Researchers can also remove the Tandy 102 computer contained in the briefcase and carry it into the field or nursery to record data and notes via the keyboard.

The briefcase design was chosen for its portability and because of the need for environmental protection. Inside the case is an aluminum chassis upon which sits a 40-column Star dot matrix printer and the Tandy 102 computer. Under the chassis are the printer control board, power supply, and a powerful analog-to-digital (A/D) converter with its own microprocessor control. In essence, it is a computer on top of a computer. The Tandy is used to collect and store the data, while the system underneath the chassis is programmed to convert the analog signal coming in from a pair of load cells to a weight, which is then uploaded to the Tandy.

Anybody can buy off the shelf the printer and Tandy computer contained in the briefcase, but the microprocessor-controlled A/D converter was custom designed by the Jacobsen Holz Corporation. Features of this custom electronic device include an HMS6303 microcomputer—programmable in *BASIC*—10-bit analog-to-digital converter, 11-analog input channels, 8-bit digital output, up to six relay outputs, RS-232 communications, two load cell conditioning modules and 12V DC power.

To house this data collection system, a TSE briefcase, manufactured by the Diversified Case company, was chosen because of its ruggedness (they advertise the case showing someone trying to open it with an axe) and also because it has an environmental seal between the lid and the bottom half of the case. Two large holes were cut into the top of the case to allow a view of the printer and computer, and a smaller hole was cut in the side for an electrical connector. A piece of plexiglass filled the hole through which the printer is observed but the other hole fit over the Tandy 102 just contacting the computer around its upper edge. The computer has a transparent membrane covering it to keep out moisture and dust, and foam rubber provides the environmental seal between the briefcase and the computer.

THE TANDY DESIGNED FOR RESEARCH

The data collection program for the Tandy was designed in such a way that it can be configured to suit the researcher's experiment. To begin with, the computer prompts the user to select either alfalfa, beans, corn, or wheat for the type of plant being studied. It then requests a Field ID, identifying the configuration that will be input. This configuration will be used many times during the year and will automatically be recalled whenever this Field ID is typed in. The researchers' fields are divided up into rows and ranges, so the computer prompts for the first and last row and the first and last range. Next it asks for the number of traits to be scored and also for the attributes of each trait, such as whether the data is input via the keyboard or via the electronic interface. Also it asks for the expected upper and lower bounds of the trait data. Finally it requests the pattern of movement through the field (i.e., circular, serpentine, etc.).

Collecting data in the field is simple. The computer tells you where you are (or should be) and requests an input for each trait. If the researcher is walking through a field with the Tandy scoring different traits, the Field System would prompt the researcher for a score, or possibly a measurement (e.g., plant height). After this information is entered for a particular plot of plants, the computer would prompt the researcher to move on to the next set of plants where the same traits would be scored again.

PHYSICAL MODIFICATIONS

Agripro harvests their alfalfa plots with a research machine called a Carter harvester. Installing an electronic data collection system on this harvester was the most challenging part of the project. These machines use a rotating flail to cut the alfalfa and to blow it through a chute into a bucket. This method of cutting requires a lot of horsepower, which results in extreme vibration in the machine. Electronics do not like vibration.

The modifications to the harvester included the redesign of the bucket, addition of hydraulics for raising and lowering the bucket and the installation of two load cells for measuring the weight of the cut alfalfa. The bucket is normally in a down

Continued on page 11.

PRODUCTS MENTIONED:

Booster Pak—$499.00
Traveling Software, Inc.
North Creek Corporate Center
18702 North Creek Parkway
Bothell, WA 98011

TSE Briefcase
Diversified Case
Ellis Avenue—86
Whitesboro, NY 13492
(800)553-2411 or in NY (800)258-1188

Star 40-column dot-matrix printer (DP-834-12)
using a control board (BD-83-12)
Star Micronics, Inc.
70-D Ethel Road West
Piscataway, NJ 08854
(201)572-9512

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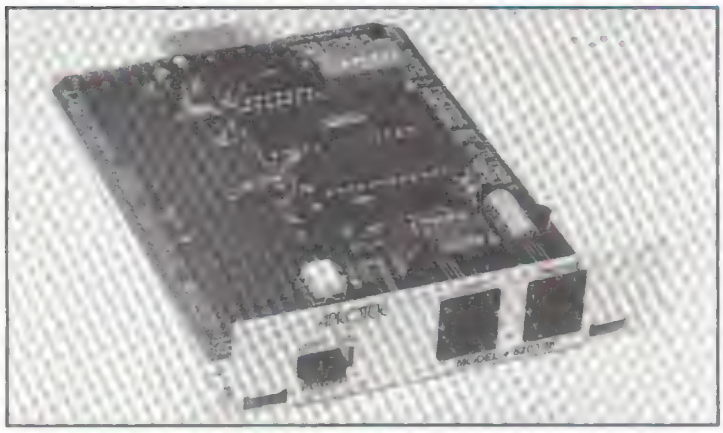

THE CHOICE WAS OBVIOUS. After we found how useful a laptop would be in our day-to-day use and especially when out of the office, we checked into what was available. Feature for feature the first choice turned out to be the 1400 LT. The reasons are many: 1- Good battery life, 2- Clear, easy to read screen plus a connector to a color monitor, 3- Small enough and light enough to really be called a laptop, 4- Full size/feature keyboard w/ option to plug in a AT style unit if desired, 5- 100% MS-DOS compatibility . . . and on and on.

OF COURSE the second thing we wanted to do was add options and a modem is almost a necessity. This is where we (as a modem manufacturer) didn't think that Tandy had the best choice. What we wanted was to have our cake and eat it, too. We wanted a modem that wouldn't adversely affect our battery life. Typically, the modem is used for about 5 to 10 minutes per day so why have it draw power all the time? Although the Tandy model goes into a lower power state when deselected through the set up menu, (as does ours) it still takes unnecessary power and does reduce battery life. We felt that we could improve on that feature plus a few other so we set to work. The result is MINIMODEM-T™.

WE CUT THE POWER CONSUMPTION WHEN NOT IN USE TO ZERO. And Tandy uses 6 times the power that we do when the modem is in use. The result is that using the MINIMODEM-T™ has virtually no effect on battery life. We also improved several other features as well. MINIMODEM-T™ has a set of internal dip switches which allow you to force Carrier Detect (CD) and/or Data Terminal Ready (DTR) true. You can set the defaults you want for Result Codes (on or off and in words or number codes as you wish), Echo, Auto Answer and USA or European (CCITT V.22 and V.21) modes. If you are an international traveler, this is crucial.

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COMPATIBILITY: Tandy 100/102/200/600 and clones; probably all other portables, but not fully tested

Want Attention? Get a Laptop

But don't expect to get any work done.

by Dan Gutman

Portable laptop computers help you increase your business productivity. Sure they do.

Laptops, in fact, cut *down* your productivity. The second you pull out a laptop and begin working on it, somebody will inevitably come over to annoy you. Laptops attract interested passersby like light bulbs attract moths.

I was in the library researching a book I'm working on. I take notes on my trusty Radio Shack Model 102 so I can zip them easily into my desktop computer when I get home. It saves a lot of time—or so one might think.

I was minding my own business when I see this guy looking at my computer.

"I see you have the 102," he says, as if we should be buddies because he knew the model number. "How do you like it?"

That's how it always starts. If a stranger comes up to you and asks you how you like your computer, you should instantly know two things about him.

1. He's boring. People joke about insurance salesmen and accountants, but there's nothing worse than a computer literate bore.

2. The only way to end a conversation with him is to be rude.

The correct course of action would have been to fake chest pains and run screaming out of the library. Unfortunately, I politely told the man how much I like my laptop and how useful it is to me.

Then he says, "Have you got a minute?"

Before I could escape, he tells me that he's starting his own company and everything will be computerized. In a flash, he whips out a sheet of paper and sketches a floor plan with computers, laser printers, file servers, and cables connecting the whole shebang together.

As if I care! A half an hour later, I was still sitting there, disbelieving, listening to this guy.

"That's great," I finally said, looking at my watch. "I wish you all the luck in the world."

Mind you, this guy didn't know I write about computers for a living. He simply saw me using a laptop and decided that I was the person he should tell the story of his life. If I hadn't had my laptop with me, he wouldn't have said "boo."

And if he had known I write a computer column, he probably would have taken me hostage and forced me to listen to everything he knows.

This is why laptops don't increase productivity.

The ads for laptops always show businessmen busily working in cabs, trains, and planes. Work on an airplane? Forget it. When the other passengers see your laptop, they act like you're Thomas Edison bringing your first phonograph to the patent office.

Using a laptop in public is a great conversation-starter for lonely people to make new friends. It's also a great way for shy guys to meet women. But it's a lousy way to get any work done. ❑

This article was taken from Dan Gutman's column in the Miami Herald.

Agripo, continued from page 9.

position when cutting. But after each plot is harvested, the bucket is raised and suspended by the two load cells and a weight reading is recorded. The load cells required isolation mounts to dampen as much of the vibration as possible. Two load cell conditioning modules in the briefcase system also help dampen noise that would distort the data. Currently, weights to the nearest 0.1 pound are being collected during the harvests.

Agripro has a progressive attitude when it comes to computerized data collection. This same system will soon be mounted in a corn combine to collect moisture and weight measurements during harvest season, and they expect to use the Tandy to collect notes as the alfalfa researchers do. Other research stations in the organization are also using the Tandy to collect data.

Recently JHC has developed another computerized data collection system they call AGRIS, an acronym for the AGricultural Research Information System. AGRIS is similar to the AGRIPRO data collection system, but instead of using the Tandy laptop computer, they have chosen the new Psion Organiser II as their data collection computer. This system is also designed to be used to collect notes on foot or as part of a harvesting machine data collection system.

Computers will continue to be found in places where a few years ago you wouldn't have expected to see them. And laptops and portables are becoming more and more powerful with some even using the popular 386 microprocessor. However the smaller, less expensive, yet powerful laptops such as the Tandy 102 still continue to hold a strong attraction to its users, and new users are finding they quite adequately meet their needs. For Agripro, the simplicity and portability of the Tandy laptop proved to be a much more desirable asset than 32-bit architecture and 20-megahertz speed. ❑

The Jacobsen Holz Corporation is located at 1224 Pattee Street, Box 280, Perry, IA 50220, (515) 465-3567.

COMPATIBILITY: Tandy 100/102/200, Olivetti M10, Kyrocera KC-85, NEC PC 8201A/8300; UNTESTED: Tandy 600, 1400LT

Feeling Senile?

Challenge your cranium with this computer version of "Concentration."

by Russ Hall

This is my best homemade game. It simulates the game of "Concentration" as played with a deck of cards, where players take turns trying to match pairs of cards. No doubt, you've played it before, but just in case you haven't, here's how it works.

To start, the dealer spreads out the deck of cards face down and mixes them up, On your turn, you turn two cards face up. If they match, you score and get to go again. If not, the two cards are turned face-down again, and the other player gets a turn. Go until you've matched all the cards. That's all there is to it.

On the computer, to turn a card face up, press the number of its row (*Vert*, 1-6) followed by the number of its column (*Horiz*, 1-5). You can separate the numbers with any character (e.g., space, comma, etc.) or none at all. Since the only choices are one-digit numbers, the program figures it out and separates them.

The game involves memory, because you learn—from your own and your opponent's mistakes—where the cards are that you'll need. Even though this computer version has only fifteen possible pairs, it may nevertheless be more difficult than the card game because a deck of cards contains four of a kind, where the computer version uses only discrete pairs of graphic symbols.

As you play, the computer keeps track of whose turn it is and each player's score, declaring the winner at the end of the game.

You don't have to have an opponent, though. It also includes a one-player mode in which the computer keeps track of the number of attempts versus the number of successful matches. At game's end, it calculates and reports a not-very-official "rating" of your memory power.

For those interested in the program's internal operation, here's a brief description of the function of certain program lines. For those of you who aren't, just type in the game and have fun!

10-60	Game title, instructions.
70-200	Initialize variables; read print positions and graphics characters.
210-220	Screen setup, branch to single-player section.
230-240	Alternate players on double-player section.
250-305	Check for match, keep scores, check for end of game, declare winner.
400	Single-player counter.
410-490	Check for match, score for single-player, check for end of game, rate player's memory.
500	Sound for correct choice.
510	Delay, reprint black boxes (i.e., turn "card" face down) after incorrect choice.
530-560	Get inputs, check for range, duplicates.
570	Add space to odd lines.

```
Ø ' Memory Concentration by Russ Hall, 1
986
1Ø CLS:PRINT:PRINTTAB(8)"- MEMORY CONCEN
TRATION -"
2Ø PRINT"From the checkerboard you'll pi
ck out   black squares to reveal the sym
bol"
3Ø PRINT"behind each one.  Try to rememb
er and   match up pairs of symbols. Each
 correct
4Ø PRINT"guess is worth 1Ø pts and anoth
er turn."
5Ø PRINTTAB(5)"For one or two players?";
6Ø K$=INPUT$(1):IFK$="1"THENSP=1ELSEIFK$
<>"2"THEN6Ø
7Ø CLS:DIML$(15),V(32),I(15),K(15),D(15)
8Ø FORY=1TO15:READD(Y),K(Y),L:L$(Y)=CHR$
(L):NEXT
1ØØ GOSUB 7ØØ:FORT=1TO15:IFT+R>15THENR=R
-15
11Ø I(T)=D(T+R):NEXT:GOSUB7ØØ
2ØØ S$=CHR$(239)+" "+CHR$(239)+" "+CHR$(
239)+" "+CHR$(239)+" "+CHR$(239):EREOL$=
CHR$(27)+"K":W=1
21Ø PRINT:FORT=1TO6:PRINT"    "T;:IFT/2<
>INT(T/2)THENPRINT" ";
22Ø PRINTS$:NEXT:IFSP=1THEN4ØØ
23Ø IFY=1THENY=2ELSEY=1
24Ø PRINT@63,EREOL$"Player #"Y:GOSUB53Ø
```

continued

Listing 1. A "Concentration" game you can play on your computer, with or without an opponent.

Match the pairs of symbols hidden underneath the boxes with this computer version of "Concentration."

580 Calculate print positions.
590 Check for prior play.
610-640 Main routine for revealing the graphic characters.
700-710 Randomizing routine.
800 Character and position data.

Note: every third *DATA* value in line 800 is the ASCII value of a graphics character. If you want different characters, just replace the existing values with the ones of your choice. ❑

```
250 IFS(1)=S(2)THENN(Y)=N(Y)+10:PRINT@18
3,"Player #"Y:PRINT@222,N(Y)EREOL$"point
s"ELSE270
260 GOSUB500:IFW>30THEN280ELSEV(W-1)=P(1
):V(W)=P(2):GOTO240
270 GOSUB510
280 IFN(1)+N(2)<>150THEN230
290 IFN(1)>N(2)THENPRINT@263,"PLAYER #1
WINS!"
300 IFN(1)<N(2)THENPRINT@263,"PLAYER #2
WINS!"
305 BEEP:BEEP:FORT=1TO2500:NEXT:END
400 NT=NT+1:PRINT@63,EREOL$"First choice
?":GOSUB530
410 IFS(1)=S(2)THENCC=CC+1:PRINT@183,CC"
Correct"ELSE430
420 GOSUB500:IFW>30THEN440ELSEV(W-1)=P(1
):V(W)=P(2):PRINT@223,NT"tries":GOTO400
430 GOSUB510
440 IFCC<15THENPRINT@223,NT"tries":GOTO4
00
450 PRINT@180,EREOL$:PRINT@221,INT((CC/N
T)*100)"percent. Your":PRINT@262,"Memory
 is "
460 IFCC/NT>.5THENPRINT@273,"GREAT!":GOT
0305
470 IFCC/NT>.42THENPRINT@273,"good!":GOT
0305
480 IFCC/NT>.34THENPRINT@273,"fair.":GOT
```

continued

```
0305
490 IFCC/NT>.26THENPRINT@273,"poor.":GOT
0305
500 FORJ=900TO1000STEP-100:SOUNDJ,2:NE
XT:W=W+2:RETURN
510 FORJ=1TO700:NEXT:PRINT@P(1),CHR$(239
):PRINT@P(2),CHR$(239):RETURN
530 M=1:A1=0:B1=0:GOTO550
540 A1=A:B1=B:PRINT@63,EREOL$"Second Cho
ice?":M=2
550 PRINT@103,EREOL$"Vert Horiz";
551 PRINT@146,EREOL$;
552 LINEINPUTI$:A=VAL(LEFT$(I$,1)):B=VAL
(RIGHT$(I$,1))
554 IFA<1ORA>6ORB<1ORB>5THENBEEP:GOTO550
560 IFA=A1ANDB=B1THENBEEP:GOTO550
570 IFA/2=INT(A/2)THENG=0ELSEG=1
580 O=R:P(M)=(A+1)*40-(33-G)+(B*2-2)
590 FORT=1TOW:IFP(M)=V(T)THENBEEP:GOTO55
0
600 NEXT
610 FORT=1TO15:IFI(T)=P(M)THENPRINT@P(M)
,L$(T);:S(M)=T
620 IFT+O>15THENO=O-15
630 IFK(T+O)=P(M)THENPRINT@P(M),L$(T);:S
(M)=T
640 NEXT:IFM=2THENRETURNELSE540
700 FORT=1TOVAL(RIGHT$(TIME$,2)):R=RND(1
):NEXT
710 R=INT(RND(1)*15+1):RETURN
800 DATA 50,95,135,249,167,145,87,169,14
9,136,253,148,175,93,128,89,208,131,171,
56,132,212,52,133,91,255,130,128,214,171
,247,130,156,132,251,143,54,210,93,134,1
73,37,216,48,139
```

End of listing.

COMPATIBILITY: All notebook computers with word processors.

A Notebook Database

Everything you need in a database—and less.

by Ross G. Brochhagen

I guess you could consider me a real estate agent. However, my contract limits my buyers to a stay of only two or three days on their land. The "land" offered is really space for exhibitors to display their products and services in regional, industrial, and commercial trade shows. One show I sold, in particular, consisted of five hundred booths and required considerable follow-up and accurate record handling. For this show and others, I used my Model 100, exclusively, for telemarketing. The 100 held its own through every record out of the thousands of prospects and show details passing through its little memory chips.

My method of recording client information, filing, and follow-up are unique to this business, but I think you can easily modify it to fit your needs. For me, with a minimum of 100 phone calls per day, I soon learned my efficiency was directly proportional to the method and speed of the recording and follow-up system I used. I chose the Model 100 for reasons that will become obvious. And until an improvement comes along, it will remain a permanent fixture in my office.

A TYPICAL IBM PC DOESN'T WORK

For me, the typical database lacked the speed and flexibility needed to accommodate some job pressures and demands of clients, not to mention the report details required by my home office.

Let's assume Mr. Salesman has just entered his office. The phone rings, and his desktop PC is turned off. After answering the phone, he switches the computer on, waits for it to boot, selects a file so he can enter the new prospect, waits for the screen to load, and then asks for the name, address, and phone number—in whatever order or however the database requests the information. The original format is normally user defined but often he finds a flaw in his original design somewhere down the road, discovering that the PC's *user-defined* format is nevertheless relatively inflexible.

In a world of impatient people, few tolerate waiting in line for service. Often the time required to enter the information into a database is simply too slow. Or the space within a field is often not quite wide enough. Maybe he needs a person's title, or the new ten-digit zip code will not squeeze into the old format. He might often resort to the stone-age pencil to compensate for the incompatibility at these moments, and make revisions in the database later. The prospect may then throw our salesman a zinger and ask him also to forward information to the home office in California. For the salesman, this would mean exiting that record, selecting a new one, entering the information, and most likely forgetting where he left off.

When I made my requirements clear to Radio Shack several years ago, they told me I would require a box that would consume a good portion of my modest office and weigh about 50 pounds. I had a choice of absorbing ultraviolet rays from a choice of either orange or green screen, which would only help the pharmaceutical business sell more aspirins. "With all those records, a hard disk was the only way to go." It would add presence to my office with a gentle blast of hot air from a whining disk that would sing to me every day like the purr of a 747. I was warned, "You don't dare move this baby around or it (the 747) will crash." (And all—records—on board will be lost). All this for an incredible bottom line of $5,000 plus complicated software.

```
Mr. Michael Nugent
Portable 1ØØ Magazine
P. O. Box 428
Peterborough, NH Ø3458-Ø428
```

Figure 1. Create labels like this, ready to print in your Model 100/102 TEXT *mode. The* TAB *at the beginning of each line saves bytes and makes the printed label look better.*

A BETTER 'BASE

This event took place just after the Model 100 was introduced, but as you have probably gathered by now, I do not own a monster that works only if you give it a boot and wait one or two minutes for it to say "Hi," wait again for it to find a record, and hope you have selected the correct field to locate the information for the impatient caller, who by this time has hung up. I wanted all information available to me instantly from an off position.

The Model 100, with its eight-line screen, will not permit unlimited field entry into a database or, for that matter, entry that exceeds the one-line-per-field format. In other words, you cannot write unlimited notes, like a letter that may be very important in closing a sale. The space limitations can be overcome with the large-screen desktop using multiple note fields, but I am addressing the benefits of the Model 100 here and maximizing its potential as a sales aid.

The database required for my application had to be a continuous and unlimited scratch pad that would display structure and uniformity, make sense on a report, and generate labels. The criteria for entering and using information received from a phone call must become a self-forming database that would enable printing of labels with typewriter appearance (including commas, periods, proper spacing and the Mr./Mrs./Ms. prefix). This would print directly from the record I was working on at any moment, so I wouldn't have to exit to a report mode and tie up the computer, where should another call come in I could not

Four Model 100 Books!

① **The Model 100 Program Book** by Terry Kepner and David Huntress. 51 useful BASIC programs for home, office, and education: bar graph, depreciation, annuity, pie chart, forms creation, invaders game, memory scan, touch typing tutor and many others-$14.95.

② **60 Business Applications Programs** for the TRS-80 Model 100 Computer by Terry Kepner and Mark Robinson. 60 powerful programs for interest calculations, annuities, depreciation, invoices, breakeven sales analysis, and more-$19.95.

③ **Inside the Model 100** by Carl Oppedahl "...an excellent Guide" —New York Times. A thorough guide to the Tandy Model 100. Learn about A.L. programming; disassembled ROM routines; keyboard scanning; UART, RS-232C, and modem; Clock/calendar chip; Interrupt handling; 8085 instruction set-$21.95.

④ **User Guide and Applications for the TRS-80 Model 100 Portable Computer** by Steven Schwartz. 14 ready-to-run programs for business: statistics, graphics, sound, and more. With cassette tape-$44.95. Buy them separately— the book is only $19.95; the cassette tape is only $27.00.

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retrieve information. The follow-up date, pertinent information about the call, and generation of call reports would also have to be handled from the same file. After processing a lead, this information must be transferred to an exhibitor file or dead list.

Let's be positive and say the prospect becomes an exhibitor. In my case, I would then need the flexibility of moving his record to a separate file where I could follow up on his deposit and other information such as booth number, date paid, comments, etc. If he declines, well, I place him in a special file, with a choice label that I am not at liberty to print here. This is a sizeable order for a small notebook computer, especially when it's asked to perform these functions minus some kind of vertical-market software.

```
        Mr. Michael Nugent
        Portable 1ØØ Magazine
        P. O. Box 428
19JL $  Peterborough, NH Ø3458-Ø428
```

Figure 2. Using the space created by the TAB *in line 4 of the client label, you can include codes, such as the above, which show information about the client. Here,* 19JL *indicates July 19, 1989, the next date the client should be contacted.*

Another criterion was multi-tasking, so I bought three, eight-bank Model 100's that talk to each other via disk drives, switching, and modem communications. Two IBM Quietwriter 2's and a Quietwriter 3 print either labels, quality-mode letters, or draft printouts without changing any printer setup. Switching allows intermixing printers and computers. Granted, the printers, including switches and cables, ran over $4,000.00, but over the years I paid for them with time saved.

HOW TO GO ABOUT IT

If you use the *F1* (*Find*) key in *TEXT*, it always displays the found character *string* on the fourth line of the screen (provided the string is not showing on the screen at the beginning of the search). With this in mind, you can set up a label for a screen dump in the way shown in Figure 1.

```
        Mr. Michael Nugent
        Portable 1ØØ Magazine
        P. O. Box 428
19JL $  Peterborough, NH Ø3458-Ø428
        (6Ø3)924-9455
        Booth #2ØØ
        Paid 23JL $495.ØØ
Notes:ΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠ
Notes:ΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠΠ
Etc.
```

Figure 3. Below the label information, you can complete your client database by typing more information about a client. And you can still print a label from this screen in about ten seconds.

Notice several points about the label. First, the left margin is tabbed on each line, which uses only one byte of memory (for one tab) instead of eight bytes using the space bar (eight spaces). The tab allows the flexibility of note entry into the left margin (as shown in Figure 2)—up to seven characters on the fourth line of the label—without disturbing the label position on the screen, and it also allows the printer to work further into the carriage, which can secure the label better with the rubber guide rollers. Second, the coded information entered into the left margin serves a dual purpose. It indicates some task you want to do, such as a follow-up phone call on a certain date and, after a text search, automatically positions the label at the correct point on the screen for printout. The margin can contain any short note, or coded information, regarding follow-up on the client, such as date, reason for call, etc.

You can add lots more information on the screen, but you can still use this label address to print labels, singly or in bulk. You can *SEL, COPY*, and *PASTE* the original label into a separate *LABEL.DO* file containing only the address shown on the screen. Just make sure the top line of the label is flush with the top of the screen before printing it. As you add new labels for a bulk mailing, keep them spaced so only one complete label shows on the screen at any time as you scroll through the file. Later, these labels may be run individually or in succession. You can find individual labels using the *Find* key. If you need bulk mailing, you should copy each record into the *LABEL.DO* file and space it properly, which I consider only a minor handicap in contrast to the real time saved because I can enter as much information as I like without the confines of a formatted database system. For my application, it is perfect because I send out almost all information individually. And my home office can review my complete files, by modem, since they're in a text format and compatible with ASCII (essentially alphabetic, not machine language) systems. If I do a multiple-label mailing, I view the labels with the *T-Word* plot mode to ensure proper

spacing of labels before running them.

Referring to our sample label again, notice the final setup shown in Figure 3.

Inserted in the left column on the fourth line of the address is a coded date I use to tell me when to make follow-up calls. Normally a date is written 07/19/89, but room will not allow this; therefore, all I use is *19JL*. As I search the follow-up calls with the *Find* key (press *F1*, type *19JL*, and press *ENTER*), the cursor always lands on that date in the margin for update editing and sets the position of the record on the screen. You may continue locating clients with that *String:19JL* for all follow-up leads, previously set for that date. With this method, you don't have to enter a specific field to search for record information, a characteristic (drawback) of the fixed database format.

Let's say the client lost a contract previously mailed to him, and he requests a second one. The first procedure is to remove the *19JL* with the *DEL/BKSP-SHIFT* key combination starting at the left edge of the screen, or use the *SEL/CUT/PASTE* option. Next, move the cursor to the far left margin of the telephone number and press the *ENTER* key. This brings the telephone number down one line. Move the cursor up to the vacant line and proceed to press the *ENTER* key, dropping the record information below the screen's view until only the label shows. Press the *PRINT* key and the label is printed as it shows on the screen. It doesn't matter if a label has four, five or even six lines. I use the PRES-a-ply labels by Dennison (#41 704), which fit the eight-line spacing perfectly. If you can't find these eight-line labels in your office supply store, they measure 1.5 inches high by 5 inches wide (each label takes up three tractor-feed holes). The printer is automatically positioned for the next label without any adjustment to its carriage.

After you have printed the label, go back to the left margin again (the first blank line after the address) and delete the spaces under the label. You will automatically bring up the telephone number, followed by the information pertaining to the record, to its original position. Simply enter the new follow-up date in the margin of the fourth line and you are ready to proceed to the next record. Although this operation may seem involved, it consumes only ten seconds when mastered.

I don't suggest making the above text files longer than 15,000 bytes. When editing the top of a file of that length, you will notice a delay when you insert or delete text since most of the bytes in the file have to be moved around in memory. I usually split up the file to reduce the effect. The end of the file does not have this problem.

The system outlined costs nothing to operate, is fast, and uses no precious RAM space normally consumed by an operating system. You cannot sort with it, but that did not present a drawback to me because I've never needed it. Once you have used it, you may never return to the formal database, which requires time-consuming report modes to print labels and reports. I have waited 25 minutes to print out a small report using *T-Base*. I use *T-Base* from Traveling Software and Super ROM from PCSG only when time is no factor. ❑

PRODUCTS MENTIONED:

T-Word
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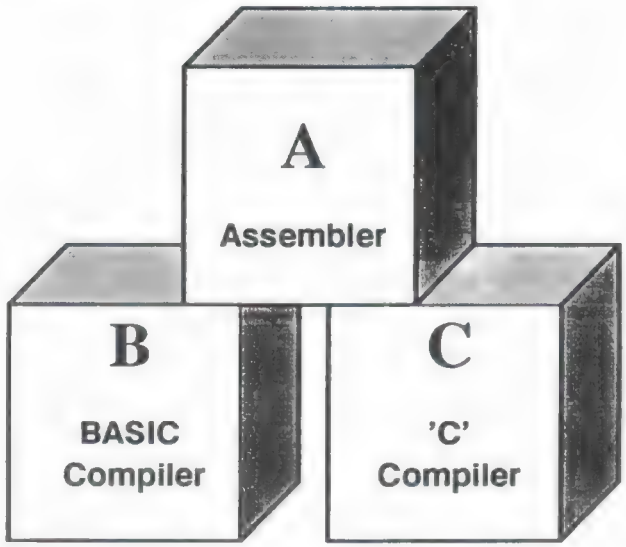

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COMPATIBILITY: Tandy 100/102, Olivetti M10, Kyocera KC-85, NEC PC-8201A/8300 (with modifications); Untested: Tandy 200, 600, 1400LT

No More Messy Pens!

Use SKETCH.BA *to create pictures for your Model 100 screen.*

by N.F. Ireland

The Model 100/102 ROM contains an extensive list of graphics in the form of graphic characters. You can normally use these characters by pressing the *GRPH* key in combination with an alphanumeric or punctuation key, with or without pressing the *SHIFT* key. These characters are listed on pages 213-216 of the Model 100 computer manual. Unfortunately, because of the inconvenience of looking up two or three keys in the manual, programmers often ignore these characters when they prepare LCD screens, but including them can provide much more innovative and interesting programming.

With *SKETCH.BA* you can conveniently create and edit a picture on a screen using these graphic characters, and you can create a file full of data statements that can recreate the screen in a program.

When first *RUN, SKETCH.BA* provides an input selection menu. Option *C* sends you to the drawing screen. Here, you can type alphanumeric characters from the regular keyboard. But if you want graphic characters, you can change from the alpha selection by pressing the *SHIFT*-down arrow key combination. Here, you can type graphics characters in place of alphanumeric characters. Return to alphanumeric selection by pressing the *SHIFT*-up arrow key combination.

Programmers often ignore these characters when they prepare LCD screens

Use the cursor control keys to move the cursor about the screen. Moving the cursor without pressing a letter/graphic key will leave that position without changing it.

When you complete your drawing, press the *ESC* key. Be patient; you'll notice a short delay while *SKETCH.BA* reads the information on the screen and records it into an array. Note that blank locations on the screen are not recorded (because they will be reproduced on the screen as blanks anyway) and the less dense a screen is, the fewer bytes required in the array and in the subsequent recording to the text (*.DO*) file.

When the program has completed copying the screen to the array, the second menu is displayed. The first option, *V*, displays

```
10 '*SKETCHer.BA* V1.3 for sketching in
PRINT@ mode with recording to RAM
20 'by N.F.Ireland 11/20/88
30 MX=MAXFILES:IFMX<>1THENMAXFILES=1
32 PRINTCHR$(27)"V";
40 DEFINTP:DIMLO(319),CH(319):DEFSTRA,F:
AD=","
50 CLS:PRINT@16,"SKETCHer":PRINT@80,"PRE
SS: <C>reate new screen":PRINT@127,"<R>e
trieve existing screen"
60 ONINSTR(" CcRr",INKEY$)GOTO60,150,150
,80,80:GOTO60
70 REM INPUT SCREEN TEXTFILE
80 CLS:INPUT"ENTER EXISTING FILENAME";FN
:OPENFN$FORINPUTAS1
90 CLS:PRINT"INPUTTING SCREEN DATA FROM
";FN
100 IFEOF(1)THENCLOSE:PN=PN-1:GOTO460
110 INPUT#1,LO(PN),CH(PN):PN=PN+1
120 GOTO100
130 REM POSITION CURSOR ON SCREEN
140 PRINT@PA-PF+1,"";:GOTO170
150 CLS
160 PN=0:PRINTCHR$(27)"P"CHR$(27)"H";
170 A=INKEY$:IFA=""THEN170
180 PH=POS(0):PV=CSRLIN:PA=PH+(40*PV)
190 IFASC(A)=2THENPG=1:GOTO170
200 IFASC(A)>31ANDPG=0THEN290
210 IFASC(A)>44ANDPG=1THEN300
220 IFASC(A)=20ANDPG=1THEN300
230 IFASC(A)=28ANDPA<319THENPF=0:GOTO140
240 IFASC(A)=29ANDPA>1THENPF=2:GOTO140
250 IFASC(A)=30ANDPV>0THENPF=41:GOTO140
260 IFASC(A)=31ANDPV<7THENPF=-39:GOTO140
270 IFASC(A)=27THENPRINTCHR$(27)"Q":GOTO
420
280 GOTO170
290 PRINT@PA,A;:GOTO170
300 IFASC(A)>96ANDASC(A)<123THENA=CHR$(A
SC(A)-32)
310 IFASC(A)>48ANDASC(A)<58THENA=CHR$(AS
C(A)+191):GOTO290
```

continued

Listing 1. SKETCH.BA. *This program creates and edits screens using Model 100 graphics characters, and creates* DATA *statements that can reproduce the screen in a program.*

```
32Ø IFASC(A)=48THENA=CHR$(ASC(A)+2Ø1):GO
TO29Ø
33Ø IFASC(A)=86THENA=CHR$(ASC(A)+48):GOT
O29Ø
34Ø IFASC(A)>64ANDASC(A)<8ØTHENA=CHR$(AS
C(A)+16Ø):GOTO29Ø
35Ø IFASC(A)>79ANDASC(A)<85THENA=CHR$(AS
C(A)+171):GOTO29Ø
36Ø IFASC(A)=85THENA=CHR$(ASC(A)+44):GOT
O29Ø
37Ø IFASC(A)=87ORASC(A)=88THENA=CHR$(ASC
(A)+57):GOTO29Ø
38Ø IFASC(A)=89ORASC(A)=9ØTHENA=CHR$(ASC
(A)+58):GOTO29Ø
39Ø IFASC(A)=2ØTHENPG=Ø
4ØØ GOTO17Ø
41Ø REM PEEK LCD MEM. AND BUILD ARRAY
42Ø FORS=65Ø24TO65343
43Ø PK=PEEK(S):IFPK=32THEN45Ø
44Ø LO(PN)=S-65Ø24:CH(PN)=PK:PN=PN+1
45Ø NEXT:PN=PN-1
46Ø CLS:PRINT"  Your screen is stored in
 an array.":PRINT"Press: <V>iew & edit y
our screen,":PRINT@87,"<R>ecord to store
 your screen as          a TEXT file,":
PRINT@167,"<D>ata to store your screen i
n a          TEXT file with DATA"
47Ø PRINT@25Ø,"statements.":PRINT@287,"<
E>nd";
48Ø ONINSTR(" VvRrDdEe",INKEY$)GOTO48Ø,5
1Ø,51Ø,56Ø,56Ø,49Ø,49Ø,7ØØ,7ØØ:GOTO48Ø
49Ø PD=1:GOTO56Ø
5ØØ REM DISPLAY ARRAY ON LCD
51Ø CLS:FORPZ=ØTOPN
52Ø PRINT@LO(PZ),CHR$(CH(PZ));
53Ø NEXT
54Ø GOTO16Ø
55Ø REM PRINT ARRAY TO TEXTFILE
56Ø CLS:INPUT"ENTER NAME OF TEXTFILE ";F
I
57Ø IFPD=1THENINPUT"ENTER STARTING LINE
NUMBER";PL
58Ø CLS:PRINT"RECORDING TEXTFILE ";FI
59Ø OPENFI$FOROUTPUTAS1
6ØØ FORPP=ØTOPN
61Ø AL=STR$(LO(PP)):AL=RIGHT$(AL,LEN(AL)
-1):AC=STR$(CH(PP)):AC=RIGHT$(AC,LEN(AC)
-1)
62Ø AR=AL+AD+AC+AD:PT=PT+1
63Ø AT=AT+AR:AR=""
64Ø IFPT=9THEN68Ø
65Ø NEXT
66Ø IFAT=""ANDPD=1THENPRINT#1,"9999,Ø":P
D=Ø:PT=Ø:PL=Ø:CLOSE:GOTO46Ø
665 IFAT=""THENPD=Ø:PT=Ø:PL=Ø:CLOSE:GOTO
46ØELSEIFPD=1THENAT=STR$(PL)+" DATA"+AT+
"9999,Ø"ELSEAT=LEFT$(AT,LEN(AT)-1)
67Ø PRINT#1,AT:AT="":PD=Ø:PT=Ø:PL=Ø:CLOS
E:GOTO46Ø
68Ø IFPD=1THENAT=STR$(PL)+" DATA"+LEFT$(
AT,LEN(AT)-1)ELSEAT=LEFT$(AT,LEN(AT)-1)
69Ø PRINT#1,AT:AT="":PT=Ø:PL=PL+1Ø:GOTO6
5Ø
7ØØ MAXFILES=MX:MENU
```

End of listing.

the recorded screen for viewing and editing. As before, terminate this viewing or editing session by pressing the *ESC* key and the screen is re-recorded to the array. The second option, *R*, records the array data to a text file, which you name. It records nine *PRINT@* location/character pairs per line. *XMSFIL.DO*

```
1Ø MX=MAXFILES:IFMX<>1THENMAXFILES=1
2Ø CLS:PRINTCHR$(27)"V";:INPUT"ENTER FIL
ENAME";FN$:OPENFN$FORINPUTAS1:CLS
25 IFEOF(1)GOTO5Ø
3Ø INPUT#1,A,B:PRINT@A,CHR$(B);
4Ø GOTO25
5Ø CLOSE:MAXFILES=MX
6Ø A$=INKEY$:IFA$=""THEN6Ø
7Ø MENU
```

Listing 2. You can reproduce the screen you created using LCDTXT.BA *above.*

```
47,252,48,254,86,252,87,239,88,239,89,25
4,98,77,99,69,1ØØ,82
1Ø1,82,1Ø2,89,125,252,126,239,127,239,12
8,239,129,239,13Ø,254,138,67
139,72,14Ø,82,141,73,142,83,143,84,144,7
7,145,65,146,83,164,252
165,239,166,239,167,239,168,239,169,239,
17Ø,239,171,254,181,38,2Ø3,252
2Ø4,239,2Ø5,239,2Ø6,239,2Ø7,239,2Ø8,239,
2Ø9,239,21Ø,239,211,239,212,254
219,72,22Ø,65,221,8Ø,222,8Ø,223,89,247,2
34,248,233,259,78,26Ø,69
261,87,263,89,264,69,265,65,266,82,281,2
41,282,241,283,241,284,241
285,241,286,241,287,226,288,225,289,241,
29Ø,241,291,241,292,241,293,241
294,241
```

Listing 3. XMSFIL.DO *is an example file created by* SKETCH.BA. *If you use the* <R>etrieve *option in* SKETCH.BA, *you can see what the screen looks like on your Model 100.*

```
1Ø CLS:PRINTCHR$(27)"V";
2Ø READLO:READCH:IFLO=9999THEN5Ø
3Ø PRINT@LO,CHR$(CH);
4Ø GOTO2Ø
5Ø A$=INKEY$:IFA$=""THEN5Ø
6Ø MENU
1ØØ DATA47,252,48,254,86,252,87,239,88,2
39,89,254,98,77,99,69,1ØØ,82
11Ø DATA1Ø1,82,1Ø2,89,125,252,126,239,12
7,239,128,239,129,239,13Ø,254,138,67
12Ø DATA139,72,14Ø,82,141,73,142,83,143,
84,144,77,145,65,146,83,164,252
13Ø DATA165,239,166,239,167,239,168,239,
169,239,17Ø,239,171,254,181,38,2Ø3,252
14Ø DATA2Ø4,239,2Ø5,239,2Ø6,239,2Ø7,239,
2Ø8,239,2Ø9,239,21Ø,239,211,239,212,254
15Ø DATA219,72,22Ø,65,221,8Ø,222,8Ø,223,
89,247,234,248,233,259,78,26Ø,69
16Ø DATA261,87,263,89,264,69,265,65,266,
82,281,241,282,241,283,241,284,241
17Ø DATA285,241,286,241,287,226,288,225,
289,241,29Ø,241,291,241,292,241,293,241
18Ø DATA294,241,9999,Ø
```

Listing 4. LCDDAT.BA *shows you how to include the graphics screen* DATA *statements created by* SKETCH.BA *into a program of your own.*

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illustrates such a file. You can use *LCDTXT.BA*, a *BASIC* program, to display such a text file.

You can load text files such as *XMSFIL.DO* back into *SKETCH.BA* using the *R* option of the first menu (after you've first begun the program).

The third option, *D*, creates a line-numbered *DATA* file, which you can merge directly into a *BASIC* program. It asks you to supply a text file name and a starting line number. *XMSDAT.DO* is such a file, and *LCDDAT.BA* shows how such a file can be merged into a *BASIC* program for display.

Each of the above options on completion returns you to the second menu. The fourth option, *E*, ends the program and returns to the Model 100 main menu.

Once you have *SKETCH.BA* up and *RUN*ning, I suggest that you make a rough drawing that shows eleven boxes across the top. Under these boxes write the characters *1* through - as they appear on the keyboard. Underneath these characters, place the screen in graphics mode (*SHIFT*-down arrow), press each of the above keys, drawing the corresponding graphic character for each key. Do the same below this for keyboard characters *Q* through *P* and similarly for *A* through *L* and *Z* through *M*. When complete, this drawing will give you a quick reference to the available graphics characters.

By the way, when you're in the alphanumeric mode, you can still print graphics characters using the keys indicated in the manual (with the *GRPH* key).

If you should record an array to a RAM text file using option *D* of the second menu and forget to record a RAM text file using option *R*, don't panic. You do not need to redo the screen—just edit out the line numbers and the word *DATA* from each line of the *R* option file and delete *,9999,0* from the last line. This allows you to load this file in *SKETCH.BA*'s first menu, option *R*, for modification and re-recording. ❑

NEC CHANGES:

See Listings 5-7 for changes to the NEC PC-8201A and 8300 computers. Unfortunately, however, the NEC's do not come with a ready-made graphics character set. So to use the GRPH *key, and this program, with graphics characters, you have to configure your own. See your manual for instructions.*

```
3Ø SCREEN Ø,Ø:MX=PEEK(64354):IFMX<>1THEN
MAXFILES=1
5Ø CLS:LOCATE16MOD4Ø,16\4Ø:PRINT"SKETCHe
r":LOCATE8ØMOD4Ø,8Ø\4Ø:PRINT"PRESS: <C>r
eate new screen":LOCATE127MOD4Ø,127\4Ø:P
RINT"<R>etrieve existing screen"
14Ø LOCATE(PA-PF+1)MOD4Ø,(PA-PF+1)\4Ø:PR
INT"";:GOTO17Ø
29Ø LOCATEPAMOD4Ø,PA\4Ø:PRINTA;:GOTO17Ø
42Ø FORS=64768!TO65Ø87!
44Ø LO(PN)=S-64768!:CH(PN)=PK:PN=PN+1
46Ø CLS:PRINT"  Your screen is stored in
 an array.":PRINT"Press: <V>iew & edit y
our screen,":LOCATE87MOD4Ø,87\4Ø:PRINT"<
R>ecord to store your screen as
  a TEXT file,"
465 :LOCATE167MOD4Ø,167\4Ø:PRINT"<D>ata
to store your screen in a          TEXT
 file with DATA"
47Ø LOCATE25ØMOD4Ø,25Ø\4Ø:PRINT"statemen
ts.":LOCATE287MOD4Ø,287\4Ø:PRINT"<E>nd";
52Ø LOCATE(LO(PZ))MOD4Ø,(LO(PZ))\4Ø:PRIN
TCHR$(CH(PZ));
```

Listing 5. Changes required to SKETCH.BA *for the NEC PC-8201A and 8300.*

```
1Ø SCREENØ,Ø:MX=PEEK(64354):IFMX<>1THENM
AXFILES=1
3Ø INPUT#1,A,B:LOCATEAMOD4Ø,A\4Ø:PRINTCH
R$(B);
```

Listing 6. Changes to LCDTXT.BA *for the NEC's.*

```
1Ø SCREENØ,Ø:CLS:PRINTCHR$(27)"V";
3Ø LOCATELOMOD4Ø,LO\4Ø:PRINTCHR$(CH);
```

Listing 7. Changes to LCDDAT.BA *for the NEC's.*

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COMPATIBILITY: Tandy 200

Scripy: A Popular Text Processor Now for the 200

This small but powerful program prepares good-looking printouts.

by Thomas L. Quindry

In the September '87 issue of *Portable 100*, I presented a small, 320-byte machine-language program called the *Scripy Text Processor* for the Model 100/102. This program has created quite a bit of interest and, by popular request, I have written a version for the Tandy 200. This version works exactly like the Model 100 version. The only changes to the program are the different ROM calls and running location. I repeat what I stated in September: *Scripy* is a *text* processor, not a *word* processor. You use this program for formatting and preparing text for printing, rather than for typing text in. You still create your text file with the built-in *TEXT* program in your Tandy 200.

Like the Model 100 version of *Scripy*, this text processor program is listed as two *BASIC* programs. The main program is *SCR200.BA*, a *BASIC* file that *POKE*'s the machine language program into memory and then saves it as *SCRIPY.CO*. Once you've run *SCR200.BA*, you no longer need it and can kill it, though I recommend you save it to disk or tape first. On the other hand, use *CFG200.BA* for the initial configuration of *SCRIPY.CO*. After you have created and saved *SCRIPY.CO*, run *CFG200.BA* and answer the questions about left margin, line length, etc. At your option, *CFG200.BA* can then either save the new configuration in *SCRIPY.CO* or run *Scripy* with a one-time configuration change. *CFG200* is different from *CFIG.BA*, for the Model 100 version of *SCRIPY.CO*. Since the configuration programs *POKE* machine-dependent values into *Scripy*, you must match the proper versions.

Unless you have changing text processing needs, you can remove *CFG200.BA* from your computer after initial use. Thus the only file you need is *SCRIPY.CO*. Listings 1 and 2 give the *SCR200.BA* and *CFG200.BA* programs. If you are interested in assembly-language programming, please refer to the listing for the Model 100 version in the September ('87) *Portable 100*. Table 1, given here, shows the changes.

To use the program, type your text in your file using the *TEXT* program (include any *GRPH* key combinations as explained below). Have your printer plugged in and ready to print. At the main menu, place the cursor over *SCRIPY.CO* and press *ENTER*. When the program asks for the text file name, type the name in and press *ENTER* again. *Scripy* will format your text file and send it to the printer.

CONTROL CODES

Table 2 gives several examples of control codes you can send to your printer using the *GRPH* key (typed in using the *TEXT* mode) on the Model 100 or 200 (see the sidebar for further explanation of control codes). The descriptions of functions performed are Epson-specific (with the exception of the first

```
Ø  REM This program is public domain.
1Ø CLS:CLEAR5Ø,6Ø784
2Ø PRINT:PRINTTAB(11)"Loading SCRIPY.CO"
4Ø PRINTTAB(19)"By"
5Ø PRINTTAB(11)"Thomas L. Quindry":PRINT
6Ø FORN=6Ø784TO611Ø3:READA:POKEN,A:CK=CK
+A:NEXT
7Ø READA:IFCK<>ATHENPRINT" Checksum erro
r, check DATA statements":END
8Ø PRINTTAB(8)"SCRIPY.CO has been saved"
9Ø PRINTTAB(8)"SCR2ØØ.BA can be killed"
1ØØ PRINTTAB(4)"Himem must be protected
to 6Ø784"
11Ø SAVEM"SCRIPY.CO",6Ø784,611Ø3,6Ø8Ø6
1ØØØ DATA1Ø,9,9,69,11Ø,116,1Ø1,114,Ø,33
1Ø1Ø DATA112,237,2Ø5,23,53,2Ø5,24Ø,84,21
8,Ø
1Ø2Ø DATAØ,2Ø1,33,128,238,195,143,237,33
,165
1Ø3Ø DATA238,2Ø5,124,237,33,112,239,229,
14,7
1Ø4Ø DATA2Ø5,19,16,183,2Ø2,17Ø,237,119,2
54,46
1Ø5Ø DATA2Ø2,17Ø,237,35,13,194,152,237,6
,4
1Ø6Ø DATA17,172,238,2Ø5,186,65,2Ø9,62,9,
2Ø5
1Ø7Ø DATA79,11Ø,2Ø2,14Ø,237,2Ø5,14Ø,11Ø,
229,17
1Ø8Ø DATA112,239,62,66,18,19,175,18,14,6
2
1Ø9Ø DATA225,17,114,239,13,2Ø2,2,238,126
,6
11ØØ DATA1,254,136,2Ø2,231,237,4,254,156
,2Ø2
111Ø DATA231,237,6,3,254,157,194,237,237
,12Ø
112Ø DATA5Ø,83,238,62,32,18,35,19,254,14
Ø
113Ø DATA2Ø2,26,238,254,26,2Ø2,25,238,25
4,13
114Ø DATA194,2Ø6,237,195,25,238,229,213,
43,27
```

Continued

Listing 1. SCR200.BA. *A* BASIC *program that creates* SCRIPY.CO, *a text formatter for the Model 200.*

```
115Ø DATA126,183,194,18,238,2Ø9,225,43,2
7,195
116Ø DATA26,238,254,32,194,4,238,193,193
,35
117Ø DATA229,62,13,18,14,1Ø,62,32,2Ø5,12
Ø
118Ø DATA238,13,194,32,238,33,114,239,12
6,254
119Ø DATA14Ø,2Ø2,67,238,254,26,2Ø2,76,23
8,254
12ØØ DATA13,2Ø2,82,238,2Ø5,12Ø,238,35,19
5,44
121Ø DATA238,2Ø5,96,238,2Ø5,121,237,195,
191,237
122Ø DATA2Ø5,96,238,195,Ø,Ø,62,1,2Ø5,99
123Ø DATA238,126,254,13,218,67,238,195,2
ØØ,237
124Ø DATA58,112,239,245,33,112,239,53,62
,13
125Ø DATA2Ø5,12Ø,238,62,1Ø,2Ø5,12Ø,238,2
41,61
126Ø DATA2ØØ,195,99,238,245,23Ø,127,2Ø5,
2Ø1,132
127Ø DATA241,2Ø1,1Ø,9,9,83,99,114,1Ø5,11
2
128Ø DATA121,1Ø,13,1Ø,9,32,98,121,32,84
129Ø DATA1Ø4,111,1Ø9,97,115,32,76,46,32,
81
13ØØ DATA117,1Ø5,11Ø,1ØØ,114,121,1Ø,1Ø,1
3,9
131Ø DATA9,7Ø,1Ø5,1Ø8,1Ø1,Ø,46,68,79,Ø,4
Ø812
```

End of listing.

Model 100	Tandy 200	Function of ROM Call
0000H	0000H	Jump to here exits from program and returns to *MENU*
0FE8H	1013H	Call to here converts lowercase character to uppercase
27B1H	3517H	Call to here displays string pointed to by HL register
3469H	41BAH	Call to here moves value from location pointed to by DE register to location pointed to by HL register
463EH	54F0H	Call to here gives "?" prompt and waits for input and *ENTER* key
5AABH	6E4FH	Call to here finds directory entry for name pointed to by the HL register
5AE3H	6E8CH	Call to here loads HL with the value at memory location pointed to by HL - used to get file address in *Scripy*
6D3FH	6D3FH	Call to here prints to printer
F4B0H	ED70H	Beginning program address for *Scripy*
62640	60784	Decimal values for beginning address
F4C6H	ED86H	Program start address for *Scripy*
62662	60806	Decimal values for start address
F5EFH	EEAFH	Last available memory for machine language programs
62959	61103	Decimal value for last available memory
F685H	EF70H	Beginning of keyboard buffer - *SCRIPY.CO* uses this buffer for printer buffer plus other pointers for line count and page length

Table 1. Conversion of ROM calls used by SCRIPY.CO *for both the Model 100 and Model 200.*

three, *GRPH-1*, *GRPH-2*, and *GRPH-3*).

Graphics codes similar to those in Table 2 can be grouped to give any of the *ESCAPE*-code combinations used by your printer. With the Epson printer, for example, *GRPH-k,E* (i.e., type *GRPH-k*; then type *E*—don't type the comma) will turn on the emphasized mode, the same as sending *ESC,E* to your Epson printer. *GRPH-k,F* turns emphasized off. *GRPH-k,-,GRPH-m* turns on underlining, and *GRPH-k,-,GRPH-p* turns it off.

Using other *GRPH* codes, you can send any control code from 0 to 127. To calculate which *GRPH* key combination to use, look in your Tandy 200 manual for its control code. Add 128 to the code you care to send. Again, look at your Tandy manual for the *GRPH* key combination that matches your calculated code. The exceptions are control codes 8, 28, and 29. Add 128 to these codes and you get *GRPH-1*, *-2*, and *-3* for printer line space control.

These *GRPH-1*, *-2*, and *-3* codes let you change the line spacing of your printed text on the fly within the text file. Just replace a space character with one of the above *GRPH* key combinations in the last line of text before you want the line spacing changed. (Note: Do not replace other *GRPH* codes for a space as you do with these line space control codes.) The next time *Scripy* sends a carriage return it will change the line spacing to your specified value. *GRPH-1* sets single spacing, *GRPH-2* sets double spacing, and *GRPH-3* sets the line spacing that you specified while running *CFG200.BA*. You can change the line spacing as many times as you wish in a text file.

THINGS MOTHER NEVER TOLD YOU

Feedback from users of the Model 100 version of *Scripy* pointed out several areas of misunderstanding when using or keying-in *Scripy*. By far, most problems were in miskeying the *BASIC* programs and making improper assumptions on what to do next when an error message was given.

Considering

by David Klein

You may have wondered how the printer underlines, changes to boldface, or prints in enlarged (double width) type. Usually, printers expect to receive certain combinations of special characters that may be embedded into text.

These embedded special characters are called *control codes* (or commands), and among the wide disparity of standards, the most-used are those used in Epson printers (or the IBM Proprinter). Usually, these control codes are made up of characters that don't normally print on your screen, which means you can't simply type them using your keyboard. For example, most printer commands include the *ESCAPE* character. But most word processors won't let you type the *ESCAPE* character into your text with the *ESC* key. So you need a way to embed these special characters, and using the *GRPH* key combinations in *TEXT* is one way.

Look in your printer's manual to find your printer's control codes. Usually somewhere after the manual covers initial setup, DIP switches, and how to connect your printer to every computer imaginable is a description of the command set. You should be able to find a table that summarizes the commands,

```
Ø  REM This program is public domain.
1Ø CLS:LOADM"SCRIPY"
2Ø PRINT,"Scripy Config":PRINT
3Ø A=1Ø:INPUT"Left Margin (1Ø)";A:POKE6Ø
959,A
4Ø A=6Ø:INPUT"Line length (6Ø)";A:A=A+2:
POKE6Ø873,A
5Ø A=1:INPUT"Default linefeeds (1)";A:PO
KE61Ø11,A
6Ø A=3:INPUT"No. linefeeds for GRPH-3 (3
)";A:POKE6Ø897,A
7Ø A=12:INPUT"Skip over perforation (12)
";A:A=A+1:POKE61Ø17,A
8Ø A=66:INPUT"Page length (66)";A:POKE6Ø
867,A
9Ø PRINT"Pause after formfeed? ";:GOSUB1
ØØØ:IFA=1THENPOKE6Ø793,33ELSEPOKE6Ø793,2
Ø1
1ØØ PRINT"Linefeed with carriage return?
 ";:GOSUB1ØØØ:IFA=1THENPOKE61Ø4Ø,12ØELSE
POKE61Ø4Ø,127
11Ø PRINT"Save Configuration? ";:GOSUB1Ø
ØØ:IFA=1THENPRINT"Saved":SAVEM"SCRIPY",6
Ø784,611Ø3,6Ø8Ø6ELSECLS:CALL6Ø8Ø6
999 END
1ØØØ A=ASC(INPUT$(1))AND223:IFA=89THENA=
1:PRINT"Yes":RETURNELSEIFA=78THENPRINT"N
o":RETURNELSEGOTO1ØØØ
```

Listing 2. Once you've installed SCRIPY.CO *in your computer, use* CFG200.BA *to configure the program to your needs—margin width, linefeeds needed, skip over paper perforation, and the like.*

GRPH-1	Sends one linefeed for each carriage return. (Replace space character.)
GRPH-2	Sends two linefeeds for each carriage return. (Replace space character.)
GRPH-3	Sends user-specified number of linefeeds (specified with *CFIG.BA*) for each carriage return. (Replace space character.)

Control codes for Epson-compatible printers. Subtract 128 from the *GRPH* character entered to get code.

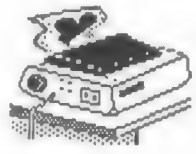
GRPH-k	code 27:	Used as *ESC* code and is the most used code
GRPH-'	code 12:	Forces formfeed (Replace CR)
GRPH-m	code 1:	Turns on certain features
GRPH-p	code 0:	Turns off certain features
GRPH-i	code 14:	Turns on double-width mode
GRPH-e	code 15:	Turns on compressed mode
GRPH-;	code 18:	Turns off compressed mode
GRPH-w	code 20:	Turns off double-width mode

Table 2. Examples for embedding control codes within text. Be sure the CAPS LOCK key is not depressed when entering codes requiring lower case letters.

SCRIPY.BA and *SCR200.BA* contain many *DATA* statements that must be entered correctly. A *checksum* value, a value calculated to check accuracy of the numbers you've typed in the *DATA* statements, is given at the end of the list of values. If the *DATA* values are incorrect, a message tells you. As you type these *DATA* values, check them carefully. Especially look at *8*'s and *0*'s. A number of people incorrectly assumed that that the program was wrong if it wouldn't save the resulting *SCRIPY.CO* program, and they saved it manually by entering line 110 of Listing 1. The result was that their computer would cold start, and they would lose everything they'd typed.

Continued on page 33.

Control Codes



such as emphasized type (bolding) or underlining, along with the control codes (in decimal and often hexadecimal numbers) that the printer needs.

For the Epson, the command for emphasized type is a sequence of two characters—*ESCAPE* followed by a capital *E*. So as your printer is typing your letter to Mom about how much you need a pair of wool mittens, you can emphasize *need* by—just before your computer sends the *n* character—sending the *ESCAPE* character to alert the printer, followed by *E* for "emphasized." The printer switches to emphasized mode, and prints *need* in boldface. Then you send an *ESCAPE* character followed by an *F* to turn off emphasized mode. More complex word processors take care of this for you automatically, but you *can* do this yourself.

One way to send these control characters is by using the *CHR$* function in *BASIC*. Probably, your printer manual gives you short *BASIC* programs that demonstrate the printer's command set. For example, for emphasized mode, the *BASIC* command *LPRINT CHR$(27);"E";* will work. The value 27 inside the parentheses, then, is the code, or *ASCII value* (in decimal), for *ESCAPE*. And since you can type *E* into the statement with your keyboard, you don't need the ASCII value for it.

For another way to use these codes, you can type the *GRPH* key combinations in *TEXT*, and use *Scripy* to send the formatted text to the printer. Look for the ASCII values of characters in your table of control codes. As you know, the *ESCAPE* character is 27. Add 128 to the ASCII value. So, for *ESCAPE*, the result is 155. Look up in your Model 200 manual table—I suggest you look in the *Tandy 200 BASIC Reference Manual* (p. 80)—and find the decimal value 155. The corresponding keyboard character is the *GRPH-k* combination (lower-case *k*). So holding the *GRPH* key down and pressing *k* is the same as placing an *ESCAPE* character in the text. You should see a left-pointing arrow(←). If you immediately follow the *GRPH-k* character with a capital *E*, you have embedded the control code for emphasized type for an Epson. Whatever text you send to your printer after this control code should print in emphasized type until you send the printer an *ESCAPE-F* control code combination. I leave it to you to look up the rest.

❑

Compatibility: Tandy 100/102

LPTCOM: Redirect *LPT* I/O to *COM* Port

Use your serial printer as if it were parallel.

by Stanley Wong

LPTCOM is a Model 100/102 program that redirects printer data from the computer's *LPT* port and sends it to the *COM* port. I wrote *LPTCOM* because I have three parallel printers at home and a serial printer at work. Developing and using *BASIC* programs that used *LPRINT* statements became a nightmare.

The main application of *LPTCOM*: is when you have a *BASIC* program that prints to the printer via *LPRINT* statements and you have a serial printer (or other serial device). Further, some machine language (*.CO*) programs use the same ROM-based print routine as *BASIC*. For these programs *LPTCOM* can be useful also.

LPTCOM does not perform true input/output (I/O) redirection as in CP/M or MS-DOS machines. The program uses an interesting programming technique that commandeers the *F7* function key string space to store the resident redirection code. The sidebar discusses the programming techniques used.

If you need only to print text files to the serial port, then you don't need *LPTCOM*. *F2COM* (Listing 3) is a simple utility that shoves a text file out the serial port.

GETTING STARTED

Create the *LPTCOM.BA* program from Listing 1 (load *LPTCOM.DO* into *BASIC* and *SAVE*). See the end of this article for alternative methods of obtaining the program.

Start *LPTCOM* the usual way (at the main menu, place your cursor on *LPTCOM.BA* and press *ENTER*). The main *LPTCOM* menu offers four choices:

I)nitialize
L)PT-->COM
C)OM LF
M)enu

The *Initialize* option sets up the *COM* port parameters. You must select this option first before any I/O redirection. If you've used the modem (*MDM*) or *COM* ports for any other purpose since *Initialize* was last run, you must re-initialize the port. The port settings are in line 42 and are set to *88N1E* (9600 baud). Change it to suit your serial device (e.g., your printer). *LPTCOM* also uses the memory reserved for the *F7* function key. If a program that you use sets *F7* and later you want to print to *COM*, you must run *Initialize* again.

Select the *LPT-->COM* option to enable or disable the I/O redirection feature.

If your serial printer (or device) requires that a linefeed (*LF*) character be sent after every carriage return (*CR*), select the *COM LF* option. If your printer overprints lines, it may need linefeeds;

```
1 'LPTCOM - Redirect LPT I/O to COM
2 ' Copyright (C) 1987,1988  Stanley Won
g
3 ' Version 1.Ø : 29 September 1988
4 '
1Ø KEY7,CHR$(13)+CHR$(245)+CHR$(2Ø5)+CHR
$(5Ø)+CHR$(11Ø)+CHR$(241)+CHR$(254)+CHR$
(13)+CHR$(192)+CHR$(62)+CHR$(1Ø)+CHR$(2Ø
5)+CHR$(5Ø)+CHR$(11Ø)+CHR$(2Ø1)
12 R$=CHR$(27)+"p" : N$=CHR$(27)+"q"
14 VA!=64228 : CL!=63Ø66 : FK!=636ØØ
27 '
28 'Main Menu
29 '
3Ø CLS : PRINT@53,R$" LPT --> COM "N$:PR
INT
32 PRINT,"I)nitialize",,"L)PT-->COM",,"C
)om LF",,"M)enu"
34 PRINT@28Ø,"Stan Wong"; : PRINT@3Ø7,"[
7Ø346,1267]";
36 ONINSTR("iI1LcCmM",INPUT$(1)) GOTO4Ø,
4Ø,5Ø,5Ø,7Ø,7Ø,82,82 : GOTO3Ø
37 '
38 'Initialize
39 '
4Ø MAXFILES=1
42 OPEN "COM:88N1E" FOR OUTPUT AS 1
44 CLS : PRINT@17Ø,R$" Done... "N$
46 BEEP : CALL21264 : CLOSE1 : GOTO1Ø
47 '
48 'LPT-to-COM
49 '
5Ø CLS : AD!=PEEK(VA!)+256*PEEK(VA!+1)
52 IF AD!=63595 THEN F$=" On " ELSE F$="
 Off "
54 PRINT@41,R$" LPT-to-COM "N$;:PRINT@7Ø
,R$F$N$:PRINT
56 PRINT,"E)nable",,"D)isable",,"P)revio
us Menu",,"T)op Menu"
58 ONINSTR("eEdDpPtT",INPUT$(1))GOTO 6Ø,
6Ø,62,62,3Ø,3Ø,9Ø,9Ø : GOTO58
6Ø POKE VA!,1Ø7 : POKE VA!+1,248 : GOTO
5Ø
```

Continued

Listing 1. LPTCOM.BA. *A program that allows you to use your serial (COM) port as if it were a parallel printer port so you can use one program even if you have the two kinds of printers.*

```
62 POKE VA!,243 : POKE VA!+1,127 : GOTO
5Ø
67 '
68 'COM LF
69 '
7Ø CLS : F$=" Off " : POKE FK!,2Ø1
72 IF PEEK(CL!)<>Ø THEN F$=" On " : POKE
 FK!,254
74 PRINT@41,R$"COM LF"N$;:PRINT@7Ø,R$+F$
+N$:PRINT
76 PRINT,"E)nable",,"D)isable",,"P)revio
us Menu",,"T)op Menu"
78 ONINSTR("eEdDpPtT",INPUT$(1))GOTO 8Ø,
8Ø,82,82,3Ø,3Ø,9Ø,9Ø : GOTO 78
8Ø POKE CL!,1 : POKE FK!,254 : GOTO 7Ø
82 POKE CL!,Ø : POKE FK!,2Ø1 : GOTO 7Ø
87 '
88 'Exit
89 '
9Ø MAXFILES=1 : CLEAR256 : MENU
```

End of listing.

if it double spaces when it should single space, it may not need linefeeds. My printers are set so that they expect the host computer to send a *LF* after each *CR*. Tandy computers, however, only send a *CR* at the end of each line, expecting the printer to add automatically the needed *LF*.

The *Menu* option takes you to the *COMLF* menu. There the *Top Menu* option returns you to the Model 100/102 main menu.

```
1 'F2LPT - Test LPTCOM setup
1Ø MAXFILES=2
12 CLS
2Ø PRINT : PRINT"Text File? "; : LINEINP
UT A$
3Ø OPEN A$ FOR INPUT AS 1
4Ø IF EOF(1) THEN 1ØØ ELSE LINEINPUT #1,
B$ : LPRINT B$ : GOTO4Ø
1ØØ CLOSE : MENU
```

Listing 2. F2LPT is a simple program to help you check out your setup. It prints a text file to the printer through BASIC LPRINT *statements.*

A SHORT STORY

L P T C O M requires a *shorting plug* for the printer port. Since the printer routine is in ROM, you have to fool the M100 into thinking that a printer is hooked up and ready.

Connect a wire jumper between pin 21 (*BUSY*) and any of the even-numbered pins 2-24. See page 206 of the *Model 100 Users Manual* for a picture of the connector. Pin number 21 is the third from the left on the top row as you look at the printer connector on the bf the Tandy computer. The even-numbered pins 2-26 are on the bottom row. Any pin except the leftmost one (pin 26) will do.

Use Listing 2, a short, *BASIC* program, to test your setup.

A WELL CONNECTED M100

To create a permanent shorting plug, buy a 26-pin connector (Amphenol p/n 84-5-02) and add a jumper wire. This is the same connector found on the M100 end of the normal printer cable. To aid in removing the plug you may want to add a short length of ribbon cable to the plug and then tie wire 21 to ground (even pins 2-24).

The shorting plug can be as simple as a push-on jumper wire of the type used for wirewrap posts. This makes for a handy "emergency" jumper if you are on the road. Be careful though—if you bump the jumper wire, you can bend the connector posts (I did). But you can obtain these at most electronics stores.

WANTED!

New hardware, new software, new ideas for the growing Tandy marketplace.

Ultrasoft Innovations (you've seen our products advertised and reviewed in this magazine) is looking to expand our product line. If you have a program or hardware device that you want advertised and distributed, or if you have an idea for a product that's needed in the marketplace, write to Richard Eckerlin, Ultrasoft Innovations, P.O. Box 247, Champlain, NY 12919 or call (514) 487-9293 (9-5 EST). This could be your ticket to fame and fortune! (Well, maybe at least fame in the Tandy community and some extra Christmas Club spending money.)

LPTCOM Technical Notes

To perform printing services, *BASIC* calls the routine at ROM location 1470H. The RAM location FAE4H (64228) contains an address of a location called by the 1470H routine after the character in the A register has been printed. *LPTCOM* assumes data originates from this routine. A routine which does an *OUT* directly to *LPT* will not have its I/O redirected.

Since the print routine is in ROM, and the RAM vector at FAE4H is called *after* the character has been printed, you cannot redirect I/O in the traditional way. What you can do is send the printed character to the "bit bucket" and also send it to the *COM* port.

The I/O redirection code is located in the string space allocated for function key *F7*. The danger of locating the code at *F7* is that some programs may make use of that function key thus destroying the machine language code.

The *F7* function key definition area starts at location F86BH (63595) and is limited to 15 bytes. The *LPTCOM* machine code is exactly 15 bytes.

The following code is loaded into *F7* on initialization:

```
DB      13      ; CR so that F7 press does nothing
PUSH    PSW     ; save A register on stack
CALL    6E32H   ; print character to COM port
POP     PSW     ; restore A register
CPI     0DH     ; was character a CR?
RNZ             ; return if not
MVI     A,0AH   ; if so load a LF character
CALL    6E32H   ; print it to COM
RET             ; return
```

The RAM hook points to the second instruction in the *F7* string space. Notice that the program assumes that a linefeed has to be sent after every carriage return character. The code at line 70 of the *BASIC* program *POKE*s a *RET* statement in place of the *CPI* instruction if a linefeed is not to be sent. This is determined by the contents of the *COM* LF flag at memory location F65AH (63066). ❑

Planning To Move?

Before you make the move, please let us know at least seven weeks in advance so you won't miss a single issue of Portable 100.

Simply clip out or photocopy this form, attach the old label, print your new address in the space provided, and mail it all to:

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Not Sure About A Product Or Service You've Seen Here?

Then why not fill out the Reader Service Card right now and send it to us? You'll receive more information directly from the vendor or manufacturer.


```
1 'F2COM - Print a TEXT file on a serial
 printer
10 MAXFILES=2 : CLS
20 PRINT : PRINT"Text File? " : LINEINPU
T A$
30 OPEN "COM:88N1E" FOR OUTPUT AS 1
40 OPEN A$ FOR INPUT AS 2
50 IF EOF(2) THEN 100 ELSE LINEINPUT#2,B
$ : PRINT#1,B$ : GOTO50
100 CLOSE : MENU
```

Listing 3. F2COM *is a simpler* BASIC *program that prints a text file to a serial printer through the serial port. The port parameters are set in line 30. The current setting is* 88N1E *(9600 baud). Change it to suit your configuration.*

```
 2 'Copyright (c) 1988 by Stanley Wong
 3 'Version 1.1 : 29 September 1988
 4 'Redirection code into ALTLCD buffer
 10 FOR I=64704 TO 64717
 11 READ J : POKE I,J : NEXT
 14 VA!=64228 : CL!=63066 : FK!=64709
 52 IF AD!=64704 THEN F$=" On " ELSE F$="
  Off "
 60 POKE VA!,192 : POKE VA!+1,252 : GOTO
 50
 100 DATA 245,205,50,110,241,254,13
 102 DATA 192,62,10,205,50,110,201
```

Listing 4. LPTMRG.DO. *Substitute these lines for the original lines in* LPTCOM.BA *if you have another program that uses the* F7 *key.*

In a pinch, you can use a paper clip. It's awkward but it works. I used this method for initial testing.

CAN YOU DIRECT ME ... ?

The I/O redirection code lives in the *F7* string space. If the program that you are using also uses that key, use the *BASIC* merge file (Listing 4) to place the redirection code in the alternate LCD (ALTLCD) buffer instead. Replace the lines in Listing 1 with the numbered lines from Listing 4. The ALTLCD buffer is 320 bytes where the M100 stores its "previous screens" used in *TELCOM* and which serves as a scratch pad for the operating system (for main menu routines). This ALTLCD buffer starts at FCC0H (64704) and is not used by the M100 system ROM. Some public-domain programs do use this area, however.

WHERE TO GET *LPTCOM*

LPTCOM is available on a diskette through this magazine's *P100-To-Go* service. It is also available on the *Portable BBS* (603-924-9770) as *LPTCOM.100*. If you need the program on a cassette tape, send $6 to me at P.O. Box 28181, Santa Ana, CA 92799. Send $6 if you need the 26-pin shorting plug (or $10 for both tape and plug). You can also contact me through CompuServe at 70346,1267 or GEnie Mail as STAN.WONG. I support the program on the M100SIG of CompuServe. ❑

Stanley Wong is employed as a computer programmer in the defense electronics industry. Playing with the Model 100 is his hobby.

FAST AND INSIDE: The ATD Modem

Here's the only 2400 bps internal modem for the 1400LT.

by Mike Nugent

I've reached the next level of challenge in my self-imposed "Evelyn Wood On-Line Speed Reading" course. Actually, it's job-imposed. I spend so much time on-line, communicating with bulletin boards and commercial database services, that reading the screen at 1200 baud is almost relaxing. The monthly long-distance and connect charges, however, are not. More like sobering, I'd say.

Those are some ugly moments—staring dumbfounded at the bills, the realization slowly dawning that what I owe would keep Imelda Marcos well shod for a year. I want to think it's a mistake. I even begin to suspect that my telephone has some kind of virus.

Sound familiar? Then what can we do about it?

We try to reduce the time we spend on-line. Abstinence? No way. Automated database navigation programs like *TAPCIS* are a great help, letting us quickly and automatically download messages and files, compose replies and such off-line, then go back on and quickly upload our stuff. Moving from 300 baud to 1200 baud made a big difference. With *TAPCIS* and the built-in Tandy 1200-baud modem, I managed to cut my bill almost in half. (Sorry, Imelda!)

Then Advanced Transducer Devices, Inc. (ATD), released the ZCOM24/TD modem, the first and only 2400-bps (bits per second) internal modem for the Tandy 1400LT. (Hot dog! She's gonna go barefoot now!)

As a relative newcomer to MS-DOS laptops, I had never installed a modem, hard drive, or anything like that before, so I didn't know how difficult it might be. Well, shucks, nothing to it! I simply unscrewed the two tiny Phillips screws securing the Tandy modem and pulled it out. Since the modem mounts flush with the computer, you have to start it out by inserting some kind of tool into two small slots in the modem and pulling. A tool with a hook on the end would be best, but I just used two small screwdriver tips. Once started, it pulled out easily. I then slipped the ZCOM24/TD modem into the slot, gently pushed it into place, and replaced the two screws. That's all there was to it.

NOW THE TEST DRIVE?

Not yet. Truth is, I'm the kind of guy who actually reads the manual first, and I had already read through it before installing the modem. It lists the features and specifications, compatibility (Standards: CCITT V.22 bis/V.22/V.21 for 2400/1200/300 bps, BELL 212A/103 for 1200/300 bps), installation, operation, command and register sets, result codes, FCC regulations, problems, and solutions.

I even begin to suspect that my telephone has some kind of virus.

The manual lists a full complement of Hayes-compatible commands to control dialing, auto-answer, result codes and extended result codes, escape codes, and so on. Of course, it includes the register commands for checking and altering the modem's internal registers. The ZCOM24/TD's registers vary somewhat from the Tandy's but are more extensive.

Additional commands control the operation and handling of various handshaking signals, selection of leased or dial-up lines, make-to-break pulse dial ratio, and various test modes. With these commands, testing is easier than with the Tandy modem, although I'll admit that I didn't perform the more exotic tests. Since I encountered no problems, I didn't need to.

THE SPEAKER TAMED

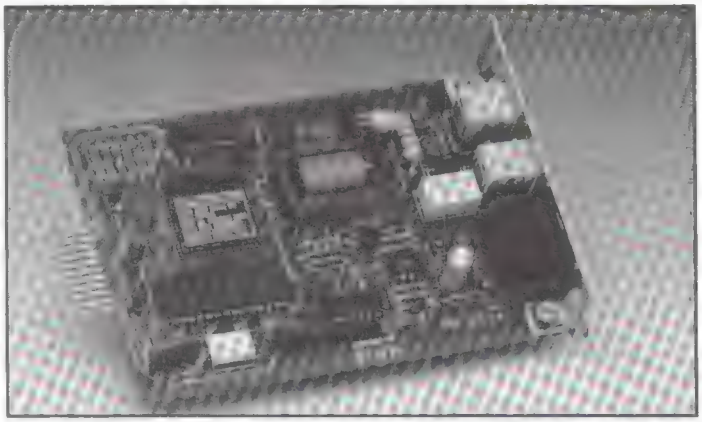
A couple of items in the manual caught my attention. I learned that the ZCOM24/TD, like Tandy's modem, uses the 1400LT's built-in speaker. But unlike the Tandy modem, this one has a command to control the speaker's volume! The Tandy modem is annoyingly loud. Although you can manually decrease speaker volume by adjusting a little control in the battery compartment, if you do, normal program-generated beeps and bleeps then become too quiet to hear. However, the ZCOM24/TD lets you select three volume levels—low, medium (the default), and maximum. By selecting the low setting, you leave the control in the battery compartment turned up, so that modem-generated and program-generated volume levels match more closely.

Another speaker command adds one more option to the three offered by Tandy. In addition to 0) speaker always off, 1) speaker on until carrier detected, and 2) speaker always on, the ZCOM24/TD offers 3) speaker on *after dial* until carrier detected. That means you don't have to listen to the dial tone, the digits being dialed, the ringing, or busy signals. The speaker remains off until the host computer answers. Then for a second or so, you hear the carrier tones as the computers connect, and the speaker goes quiet again. So you hear only the brief connecting sounds to let you know the connection was made, sparing you all the rest.

The ZCOM24/TD offers another feature not found on the Tandy modem, an optional "long space disconnect," which hangs up the phone when a space of 1.6 seconds or longer is received from the remote modem. Like the others, this feature is controlled by a modem command.

THE MODEM AT WORK

Okay, now the test drive. The manual gives all sorts of technical specifications,



The ATD ZCOM24/TD modem is the first and only 2400-bps internal modem for the Tandy 1400LT.

but that stuff is for serious technoids and holds little meaning for the average user, who just wants the modem to work easily and well. The ZCOM24/TD works easily and well!

After installing the modem with no other changes, I fired up *TAPCIS*, already configured for the Tandy internal modem I had been using. The ZCOM24/TD performed flawlessly, dialing and logging onto CompuServe, where it captured several day's worth of messages in only three minutes. Data on the 1400LT's screen went by so fast I could read only snippets of messages. (Looks like I'm gonna have to talk to Evelyn Wood again.) Off-line, I looked at the captured information—perfect copy, not a single glitch.

That's fine on a clean line, I thought, but what happens when the going gets tough? A thorough and scientific search of CompuServe nodes (I dialed a bunch at random and listened) turned up a noisy one in Boston. I logged on, listening again to be sure it was still noisy (it was), and captured messages for a few minutes. Off-line once again, I found perfect copy. In the whole time I've had this modem, I have yet to experience any missing or garbled characters. According to the manual, if the modem encounters a noisy enough line or a weak enough signal, it automatically defaults to a slower baud rate to compensate. So far, it's never needed to do so.

Using the modem with the *Telix* terminal program required a few changes in the program's modem set-up command string. Like the Hayes Smartmodem, the ZCOM24/TD's default setting is to ignore the state of the DTR (Data Terminal Ready) line. *Telix* hangs up the phone by dropping the DTR signal, but since the modem ignores that, it doesn't hang up. When that method fails, *Telix* next puts the modem in command mode and gives the *ATH* command, to which the ZCOM24/TD does respond. So it does hang up, but you still get a *Hang-up Failed* message from *Telix*.

Adding the *&D2* command to the modem set-up string tells the ZCOM24/TD to switch to the command mode and hang up when DTR is dropped. This is what *Telix* wants. When I tried it, the modem did indeed hang up when DTR was dropped, so *Telix* didn't have to give the *H* command, but it still issued a *Hang-up Failed* message.

This message is a result of *Telix* looking at the state of DCD (Data Carrier Detect) signal, which by default is asserted at all times in the ZCOM24/TD. Adding the *&C1* command to the modem set-up string forces the DCD signal to follow actual carrier presence. Now when the modem hangs up, DCD drops, *Telix* sees that and does not give the *Hang-up Failed* message.

To clarify, *Telix* **does** work with the modem's default settings; it just gives an error message anyway. Adding *&D2&C1* to the modem set-up string just eliminates the error message.

A FEW MISCELLANEOUS NOTES

I've encountered only one slight anomaly. When switched out of the 1400LT's Modem mode, the ZCOM24/TD takes the phone off-hook. Anyone calling you will get a busy signal. The responsive folks at ATD were unaware of this and checked into it. It turns out that the 1400LT is supposed to put all modem lines to high impedance when not in Modem mode, but one line doesn't quite make it, thus leaking some current, which causes the modem to take the phone off-hook. Tandy's modem takes this flaw into account. ATD says future production units will incorporate a similar fix.

Meantime, you can easily cure this little problem simply by unplugging the phone cord when in RS-232 mode.

Users of Traveling Software's *Battery Watch* need to adjust that program's setting for the drain of the modem current. The Tandy modem setting is 100 milliamperes (ma). Though not documented in the ZCOM24/TD's manual, it draws 235 ma when active, and no current at all when idle.

I was pleased to discover that the modem responds to commands typed in lower case. I've always hated having to type in all capitals to please a modem. Now I don't have to.

Included with the ATD modem is *PC-Talk III* communications software, which calls itself freeware, but may also be termed a shareware program, asking you to send a $35 "contribution" to the developers. You can use *PC-Talk III* instead of, say, *TAPCIS*, *Telix*, or *Crosstalk*, all of which I used on the ZCOM24/TD with success. The instructions for *PC-Talk III* are included on disk with the program.

Finally, and importantly, besides the two RJ11 phone jacks (one for the wall outlet and one to hook up your telephone), the ZCOM24/TD also includes a jack for Radio Shack acoustic cups (RS cat. no. 26-3818) in case you must call from, say, a pay phone.

SUMMARY

I've been eager to see a 2400-bps modem developed for the Tandy 1400LT, and I'm glad that ATD has done it. As the first and only 2400-bps modem for the Tandy 1400LT, its speed, ease of installation, Hayes-compatibility, CCITT and BELL compatibility, and extensive and flexible modem commands combine to make the ZCOM24/TD a valuable addition to the 1400LT. The money saved in communications charges will pay for this modem. Thank you, ATD.

❑

MANUFACTURER'S SPECIFICATIONS

ZCOM24/TD internal modem for the Tandy 1400LT—$299.00

- 2400/1200/300 bps with autobaud and automatic parity detection
- CCITT V.22 bis for 2400 bps, BELL 212A/CCITT V.22 for 1200 bps, BELL 102/V.21 for 300 bps
- Extended Hayes AT command set compatible
- Serial, binary, or asynchronous data input format
- Transmit level: -9 dBm
- Carrier detect threshold: -42 dBm
- Dialer type: tone or pulse
- Dialer input format: asynchronous, ASCII, 10-bit
- *PC-Talk III* data communications software included

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DEFUSR appears monthly to answer your questions about Tandy notebook computers.

Send your queries to: DEFUSR, PORTABLE 100, P.O. Box 428, Peterborough, NH 03458-0428. Please enclose a stamped, self-addressed envelope for our reply.

HOT SPOTS

I downloaded *HOTKEY* from the *Portable BBS* and found a number of conflicts with both *Ultimate ROM II* (v2.07) and *TS-DOS* which your article did not mention. *[He lists them.]* I have found the program useful, although I would much prefer a version compatible with *UR-2*.

Also, I would like to find a utility that permits appending to the paste buffer, a feature I have found most useful in word processing with my desktop PC. I understand it is available on the *Cleuseau* ROM, but I would like to see it as a stand-alone utility. Perhaps this letter might encourage programmers to create one.

I also want to mention that Tri-Mike's *Let's Play Monopoly* program has given a great deal of pleasure. I would be delighted to see further sophisticated efforts like that for the 100/102. Have you ever thought about a version of *Scrabble* for the 102?

Arnold Silverman
Portable BBS
Message to SYSOP

When I wrote HOTKEY, *it worked with v1.22 of* UR-2. *Newer UR-2's, like v2.07 and v2.12, are apparently incompatible. I could disassemble the new ones to discover the changes and probably rewrite* HOTKEY *to compensate. But this editor gig leaves me no time. Sorry!*

I believe there is a stand-alone utility for appending to the paste buffer, but I'm not sure where. Programmers—where is it? And if it isn't, please write one, so we can share it in P-100*!*

Greg Susong's extremely popular Let's Play Monopoly *program drew rave reviews. Tri-Mike Network East acquired the copyright just in time to get trounced by Parker Brothers, who declined to license it, because, as I understand it, they didn't think that enough of you would buy it to make it worth their while. (They're dead wrong, but they're bigger than I!) So I won't even consider* Scrabble*!*

(Hmmmm.... Maybe if y'all started a letter-writing campaign to Parker Brothers; 50 Dunham Road; Beverly, MA 01915. Telephone 508-927-7600...?)

-MN

GOTTA WRITE A BOOK!

I am an electronics engineer, familiar with the 8085 (opcodes and how it works) and the Model 100 hardware. The software is another matter: I've disassembled the whole ROM and identified many routines, with the help of Oppedahl's book. I have yet to learn much of what's what above *MAXRAM*. Do you have a complete map of such?

But the volume of HOTKEY mail indicates much interest in its technical aspects.

Concerning *HOTKEY*: If it must "live" where it is "born" (installed), this is inconvenient. If installed at *MINRAM*, as you suggest, it is moved upward by a *.BA* load through *FLOPPY.CO* (whereas a *.BA* loaded from tape is written at the end of the *.BA* zone) and is also moved by a *KILL* if installed at the end of the *.BA* zone. Why install it as a *.BA* and not as a *.CO*?

And why line 520? *B* cannot be less than 128 (if so, it's a ROM address). Why check *A*? And what is the *40* (last *DATA* of line 600)? The next two bytes: *INX B, LDAX D*? What are the values in these two registers, and how do they get there? And finally, how does the keyboard buffer operate with its zeros every other byte? What is the length of this buffer?

Remarks: To use *HOTKEY* when in *BASIC, ROM2* should be disabled, else *ESC* will display a next line number. To load a *.BA* file into RAM through *FLOPPY.CO, HOTKEY* must be killed before and reloaded into RAM afterward. Loading the installed version (381 bytes) of *HOTKEY* will save time.

Keep up the good work, Mike. It's excellent. I appreciate your concern about your readers, judging by the way you wrote *HOTKEY*.

Mike Kelton
Paris, France

Mike, you've finally forced me into writing an article (or a book!) on the theory and construction of HOTKEY *and similar programs, complete with assembly language source code.* HOTKEY *was a rush job for the short-lived* Laptop User *magazine, and readers seemed to prefer short install-it-and-go articles. But the volume of* HOTKEY *mail indicates much interest in its technical aspects. So look for a technical piece soon. Meanwhile, I'll tackle some of your questions.*

To complement Oppedahl's Inside the Model 100, *I recommend Morgan's* Hidden Powers of the Model 100, *which nicely explains the keyboard buffer. The Covington RAM/ROM maps and other CompuServe Model 100 Forum files are indispensable, along with past* PICO *and* Portable 100 *articles, to arm you for serious 100-hacking.*

Re HOTKEY: *Because it works full-time as an extension of the operating system,* HOTKEY *must never be disturbed. Many other programs use high RAM, so it would be unsafe there. The only RAM file never moved by* KILL *and* LOAD *is the first* .BA *program,*

ALIENS STOLE MY 102!

Mojave Desert, June 15 1988—I was in a rented Ford Mustang, driving to another conference on adolescent substance abuse, and I felt lousy. My acne was acting up and my hangover was coming on strong. I had seen very few cars recently. Suddenly I saw a bright flash... .

I awoke flat on my back in a harshly lit, white room, feeling like someone had done a cold start on my brain. As I sat up, I immediately felt worse. Grabbing my Tandy 102 carrying bag, I stood up and tried the door. It was locked. So I sat down to wait. With nothing better to do, I reached for my computer.

But my trusty old 40-column Tandy was gone! In its place was a machine so sleek and light that I could hardly believe it. It was something called a Z88. Where had it come from? Who made it? It had a built-in word processor, spreadsheet, database, diary, calculator, and a bunch of other programs all in ROM. It had pop-up menus and had been expanded to 1.5 megs of RAM! The keyboard made no noise when I typed, and the 8-line screen was 102 characters across! What a machine, and God, was it fast! Even faster than my desktop at loading, saving, and editing files. And it was so easy to figure out, with menus and help screens ...

As I sat spellbound by this incredible machine, the door behind me opened, where looking down at me was—you guessed it—an alien.

As if reading my mind, the alien spoke. "You want to know what you are doing here."

I nodded.

He continued in a perfect imitation of Saturday Night Live's Don Pardo, "We have come to Earth to market this small but powerful computer, and we need your help. I am authorized to offer you a planet-wide dealership for the Z88."

"Great!" I said. "Where do I sign?"

But he was already gone, and I was back in my car driving along that deserted road, with the Z88, a ONE YEAR warranty, a dealership agreement, and a hotline number for some star in the Horse Head Nebula ...

I've got to talk to someone about this. If you've ever been abducted by alien computer entrepreneurs or want to learn more about an out-of-this-world portable computer, call me, Jonathan Pazer, at (914)496-5199 or (914)639-9228.

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at the very bottom of RAM (MINRAM, as you call it). So I dress the machine language code as a .BA program, installing it as low in RAM as possible.

FLOPPY, *one of two "hostile" DOS's, loads .BA files into* MINRAM, *thus moving* HOTKEY. *Bummer! My DOS patches (Sept. '88, p.22) make* FLOPPY *load .BA programs just above existing .BA files (your "end of the .BA zone"), leaving* MINRAM *programs safe. The other hostile DOS,* Disk Power, *will be patched in a future issue. Anyway, that eliminates the need to kill and reload* HOTKEY.

Certain other programs can live only at absolute MINRAM, *so for compatibility,* HOTKEY *is flexible enough to install just above them. Provided you don't kill those programs,* HOTKEY *won't move. Flexibility required that* HOTKEY's *assembly source code be* ORG'*ed at address zero. On installation, offsets are added to certain addresses within the code (flagged by a -1 in the* DATA *statements) to adjust for* HOTKEY's *location. At some locations, an adjusted address could contain a zero byte, which* BASIC *mistakes for an end-of-line marker, thus trashing the file pointers. So each byte (in variables A and B) is checked to ensure that it's not a zero. If a zero byte occurs, you can relocate the code a byte or two higher in RAM, as the article explains.*

NOWRAP, *a utility on CompuServe, defeats automatic word-wrap in* TEXT.

Your ROM2 *must be the* Cleuseau *version. Chances are, it intercepts the* ESC *key before* HOTKEY *gets it. I suggest you turn* HOTKEY *off while using* Cleuseau, *then back on afterward.*

Well, there's part of the book, Mike! Look for the rest in the (near?) future. (Thanks a lot, pal! Grumble, grumble ...)

-MN

FIGHT DIP ABUSE!

I have enjoyed your magazine under Terry Kepner's leadership. Keep up the good work.

I use my Model 100 more than my Zenith (XT clone). With a Tandy PDD and printer, the M100 is a complete system. However, two features have dogged me for years.

First, at the end of a line during text entry, the software tries to fit a whole word on the screen. If it's too long, the entire word is flipped to the next line. This is useful during text input in paragraph form, but when a portion of a page is lined up in columns, it makes the task difficult. One character more or less will flip the entire entry to the next line, and it is impossible to tell whether columns on the right side of the page are lined up correctly. Is there any way to turn off this feature during columnar input?

Second, the Zenith sends a line feed to the printer with every carriage return, whereas the M100 does not. A DIP switch on the printer controls this, but the poor little switch is nearly worn out from use. Some DIP switches can be changed under program control, but this one cannot. Is there a solution?

Bob Barringer
Godfrey, IL

No problem, Bob! A utility called NOWRAP *on CompuServe's Model 100 Forum defeats automatic word-wrap in* TEXT. *Browse the Forum data libraries to find it, and download it. (Don't forget to say thanks!) If you have trouble, leave a message to the SYSOP (system operator), who can direct you to the file, plus some help files to make downloading easier in the future.*

The printer line feed problem is fixed by the LF.100 *utility (*LF.200 *for Tandy 200) available on the* Portable BBS *(see masthead for* PBBS *info) or by mail, if you send a stomped, self-abused envelope with your request (LF only, not other programs.) 'Zat flip yer switch?*

-MN

EXPANSION RAM CHIPS

I just acquired a Tandy 600, and the book says memory upgrades can increase storage to 228K in 96K increments. I've asked Radio Shack stores up and down the Eastern Seaboard, and the best I've heard is that they can be purchased from Tandy Service at $300 a pop. Do you know of a source for these 96K chips at a "reasonable" price?

Ted Brewster
Gaithersburg, MD

Sure do! The following vendors carry RAM chips for various laptop/notebook computers: Purple Computing (503)479-8087 (see ad in our classifieds); American Cryptronics (714)540-1174; Traveling Software (800)343-8080; and P.G. Design Electronics (313)727-2744. Give 'em all a call and shop around. (And tell 'em we sent you!)

-MN

❑

XTLCM3—A Better *TELCOM*

Use all three banks in your Tandy 200 without leaving TELCOM.

Several months ago I showed you how to make *TELCOM* switch RAM banks while on line, without dropping the host computer carrier. The program *XTLCOM.CO*, which is kept in RAM and run from the menu, executes in the *HIMEM* to *MAXRAM* area of Tandy 200 memory, and could possibly conflict with other programs that also run in *HIMEM*.

XTLCOM.CO, like much of the other software I have presented here, is a seed for programmers to sow and has plenty of room for improvement. Improvement of *XTLCOM.CO* has led to *XTLCM3.CO*, created by assembling the source code (Listing 1) or running the *BASIC* loader (Listing 2).

XTLCM3.CO needs to be run only once from any bank. It automatically takes you to *TELCOM* for immediate use. Once you've run it, you can save *XTLCM3.CO* and delete it from RAM. It is permanently installed in system RAM of all three banks until you run *FIXDIR.BA* (see Listing 3), a cold start occurs, or another program resets the *TELCOM* hooks. This saves file storage space as well as file execution space.

XTLCM3.CO allows you to jump from bank to bank while online with either an external or internal modem. And whichever bank you jump to, the hooks are active to allow you to switch banks again (see note below).

XTLCM3.CO uses no user RAM! It need not be in RAM after it has been run once. It does not run in *HIMEM* so it doesn't conflict with other *.CO* programs.

XTLCM3.CO runs in system RAM. The code in each bank resides in the last fifteen file slots of the directory. This means that you can have a maximum of thirty-one files per bank, instead of forty-six files. From the Tandy 200 users I have spoken to, this is not a problem, and in return for the fifteen-file sacrifice you add the following features to *TELCOM*'s *TERM* mode:

F6	=>	display files and bytes free.
F6+SHIFT	=>	direct access to *TEXT* files.
F7	=>	jump to *TELCOM* in next bank.
F7+SHIFT	=>	jump to *TELCOM* in previous bank.

It seems to me that these features could have been part of the T200 ROM, but as I mentioned in an earlier article, the system RAM hooks allow us to modify the way the T200 works, without rewriting the ROM. *XTLCM3.CO* enhances *TELCOM* by assigning those on-line features to the unused *F6* and *F7* function keys in *TELCOM*'s *TERM* mode.

NOTE: The first time you enter *TELCOM* in another bank, you will enter the *TERM* mode by pressing *F4* (Term). Should you exit this bank, and reenter it, you will have to type *TERM* and press *ENTER* if *F4* (Term) doesn't work.

-Paul Globman

NOTE: *XTLCM3* is for use with a TANDY 200 WITH ALL THREE (3) INTERNAL RAM BANKS.

```
;*************************************
;*        XTLCM3.CO                  *
;*           by Paul Globman         *
;*        Copyright (C) 1988         *
;*************************************
;
BEEP:   EQU 4F45H
BYTES:  EQU 9AFDH
CLS:    EQU 2Ø3Ø1
CRLF:   EQU 4F3EH
FILES:  EQU 2A2AH
FRAME:  EQU 65196
GONE:   EQU 9CA8H
HOOK28: EQU F53DH
INSERT: EQU 82A8H
NEWBNK: EQU EEF5H
POINT:  EQU 4F96H
POKE:   EQU 9BBØH
STAT:   EQU EF3CH
TEL6:   EQU F53FH
TEL7:   EQU F541H
TERM:   EQU 638BH
TLCOM:  EQU 24573
TRAP:   EQU EF34H
X:      EQU 636ØØ-62474
;
        ORG 636ØØ
;==================
FLAG:   DB 255
F6:     call crlf
        lda 6479Ø       ;shift?
        rar
        jnc shofil-x
;
        LXI H,GETFIL-x
        SHLD TRAP
;
GETFIL: CNZ BEEP
        CALL 29ØØ3
        LXI H,29124     ;'FILE TO EDIT'
        CALL 13591      ;PRINT IT
        CALL 21744      ;'?' & GET LINE
        RST 2           ;GOOD FILENAME?
        JZ PRETRM-x     ;NO, GO TO TERM
        CALL 11635
        PUSH H
        LXI H,Ø
        SHLD 61394
```

Continued.

Listing 1. This is the assembly language program for XTLCM3.CO, *which allows you to jump from bank to bank on a Tandy 200 that has all three banks—without leaving* TELCOM.

```
        MVI A,1
        LXI H,PRETRM-x
        JMP 29479       ;TO TEXT
;
PRETRM: CALL POINT      ;POSITION CURSR
        JMP TERM        ;TO TELCOM/TERM
;==================
SHOFIL: CALL FILES      ;display files
        CALL BYTES      ;and bytes free
        JMP CRLF        ;CRLF and ret.
;=====================================
F7:     di
        lda 6479Ø       ;shift?
        rar
        in d8h          ;get this bank
        cc nxt-x        ;backward
        lxi h,cont-x    ;continue after
        push h          ;next return!
;
nxt:    adi 4           ;forward
        ani Øch
        cpi Øch
        jz nxt-x
        ret
;
cont:   sta bm-x+2      ;set dest bank
        lxi h,newbnk    ;and poke bank
        mvi b,Ø         ;#1 with new
        mov d,a         ;active bank
        call poke
;
        lxi h,stat      ;copy stat to
        mov d,h         ;destination
        mov e,1         ;bank
        lxi b,7
        call bm-x
;
        lhld frame
        lda bm+2-x      ;switch
        out d8h         ;banks
;
        shld frame      ;adj frame shft
        lxi sp,639ØØ
        call 4c47h      ;reset sp
        call cls
;
        xra a           ;clear keyboard
        sta 64798       ;buffer
        JMP tlcom
;=====================================
;The following code will move a block
;of memory in current bank to any
;location in destination bank.
;Destination bank poked to blkmov+2 by
;earlier code.
;BC=len, HL=source adrs, DE=dest adrs
;
bm:     push b          ;save counter
        mvi b,Ø         ;dest bank in B
        push d          ;store dest adr
        mov d,m         ;data byte in D
        xthl            ;dest adr in HL
        call poke       ;POKE it!
        pop d           ;restore DE and
```

Continued.

```
        xchg            ;HL registers
        pop b           ;restore BC:len
;
        inx h           ;increment ptrs
        inx d           ;to do next.
        dcx b           ;decrement len
        mov a,c         ;and test if B
        ora b           ;and C are Ø
        jnz bm-x        ;done if BC = Ø
        ret
;=====================================
        ENTRY
begin:  di
        xra a           ;do bank 1
        call b1
        mvi a,4         ;do bank 2
        call b1
        mvi a,8         ;do bank 3
        call b1
        ei
        jmp tlcom
;==================
data:   dw F6-x,F7-x
;==================
b1:     sta blkmov+2
;
        lxi h,data      ;set hooks
        lxi d,tel6
        lxi b,4
        call blkmov
;
        lxi h,FLAG      ;hook code
        lxi d,62474
        lxi b,begin-FLAG
;       jmp blkmov      ; and return
;=====================================
;The following code will move a block
;of memory in current bank to any
;location in destination bank.
;Destination bank poked to blkmov+2 by
;earlier code.
;BC=len, HL=source adrs, DE=dest adrs
;
blkmov: push b          ;save counter
        mvi b,Ø         ;dest bank in B
        push d          ;store dest adr
        mov d,m         ;data byte in D
        xthl            ;dest adr in HL
        call poke       ;POKE it!
        pop d           ;restore DE and
        xchg            ;HL registers
        pop b           ;restore BC:len
;
        inx h           ;increment ptrs
        inx d           ;to do next.
        dcx b           ;decrement len
        mov a,c         ;and test if B
        ora b           ;and C are Ø
        jnz blkmov      ;done if BC = Ø
        ret
;=====================================
```

End of listing.

```
1 '************************
2 '*  XTLCM3.CO           *
3 '*    by Paul Globman   *
4 '*  Copyright (c) 1988  *
5 '************************
10 FOR I = 63600 TO 63830
20 READ X:POKE I,X:SM=SM+X
30 NEXT
40 IF SM = 30659 THEN 60
50 PRINT"error in data":STOP
60 SAVEM"XTLCM3.CO",63600,63830,63764
100 DATA 255,205,62,79,58,22,253,31
101 DATA 210,70,244,33,27,244,34,52
102 DATA 239,196,69,79,205,75,113,33
103 DATA 196,113,205,23,53,205,240,84
104 DATA 215,202,64,244,205,115,45,229
105 DATA 33,0,0,34,210,239,62,1
106 DATA 33,64,244,195,39,115,205,150
107 DATA 79,195,139,99,205,42,42,205
108 DATA 253,154,195,62,79,243,58,22
109 DATA 253,31,219,216,220,93,244,33
110 DATA 103,244,229,198,4,230,12,254
111 DATA 12,202,93,244,201,50,155,244
112 DATA 33,245,238,6,0,87,205,176
113 DATA 155,33,60,239,84,93,1,7
114 DATA 0,205,153,244,42,172,254,58
115 DATA 155,244,211,216,34,172,254,49
116 DATA 156,249,205,71,76,205,77,79
117 DATA 175,50,30,253,195,253,95,197
118 DATA 6,0,213,86,227,205,176,155
119 DATA 209,235,193,35,19,11,121,176
120 DATA 194,153,244,201,243,175,205,42
121 DATA 249,62,4,205,42,249,62,8
122 DATA 205,42,249,195,253,95,11,244
123 DATA 79,244,50,68,249,33,38,249
124 DATA 17,63,245,1,4,0,205,66
125 DATA 249,33,112,248,17,10,244,1
126 DATA 164,0,197,6,0,213,86,227
127 DATA 205,176,155,209,235,193,35,19
128 DATA 11,121,176,194,66,249,201
129 REM      END OF DATA
```

Listing 2. XTLCM3.BA. *This program creates the executable program* XTLCM3.CO *if you don't have an assembler for Listing 1.*

```
0 REM FIXDIR.BA by Paul Globman
1 REM            Copyright (c) 1988
2 REM
3 REM This MUST be run in ALL 3 BANKS
4 REM
5 FOR I=62474 TO 62638:POKE I,0:NEXT
6 POKE I,255
7 POKE 62783,168:POKE 62784,156
8 POKE 62785,168:POKE 62786,156
9 MENU
```

Listing 3. FIXDIR.BA *removes* XTLCM3 *from memory. You must run the program separately in all three banks.*

"Scripy," continued from page 23.

Another common error was omitting one or more *DATA* values. This would result in an *OV* (overflow) error since the program would try to *POKE* the checksum value into memory, and it is greater than 256. If you have either of these problems, recheck your *BASIC* program to make sure you haven't mistyped anything.

Scripy will not handle tab characters so do not use them in your text file. Use spaces instead. Also, do not put two spaces after a period. It may cause your left margin to be uneven if a sentence comes exactly to the end of a line. The extra space starts the next line.

Scripy can print *BASIC* program listings (listed in ASCII) as long as statement lines have occasional spaces to break them up.

Be careful using control codes that you embed in your text files to enhance text. When *Scripy* computes line lengths for formatting, it counts the control codes as if they were words. Most times this will not be a noticeable problem. However, too many control codes within one line (for advanced features, say) can cause your line to print short. But you can plan your control codes to minimize this effect. Instead of placing all the control codes in a text line, you can place a number of control codes to act on a paragraph on the blank lines separating paragraphs.

When *Scripy* was originally written, the PDD2, the newer Tandy Portable Disk Drive (200K version), didn't exist, and when the article was published, I didn't and still don't have that disk drive. The PDD2 changes the value of *MAXRAM* when *FLOPPY.CO* is installed. When the *BASIC* version of *Scripy* is run, you get an *FC* error. Line 10 is trying to set *HIMEM* greater than the value of *MAXRAM*. Delete line 10 from *SCRIPY.BA* when using it to convert to *SCRIPY.CO* for use with the PDD2.

Though I do not have a PDD2 and therefore cannot confirm it, I have been told that Model 100 version of *Scripy* will work with the PDD2 after it has been converted to the *.CO* file. I assume that the Tandy 200 version will also be compatible with the PDD2. I would appreciate your comments if you have a PDD2 and are using *SCRIPY.CO* with it. Please tell me if you have any problems. Back up your files from RAM before trying *SCRIPY.CO* with the PDD2, though.

Other than the brief description of the *Scripy* features given above, I will refer you to the September '87 article for more information. If you don't have that issue or don't care to key in the program, I will happy to provide a 3.5-inch disk for the Tandy PDD1 (100K), with both the Model 100 and 200 versions on it, for $7, which includes shipping. I will also include the assembly code listing. Those with the newer 200K version can convert the disk according to instructions in your manual. Send a check or money order to Thomas L. Quindry, 6237 Windward Drive, Burke, VA 22015. Include an addressed mailing label for faster delivery. I am usually able to send a disk the next day.

Scripy has no affiliation with any version of the *Scripsit* word processor programs distributed by Radio Shack. ❑

Editor's note: Although we do offer this program on our P100-To-Go *disks (see ad on p. 1), we will not include the assembly listing or the Model 100 version, which Mr. Quindry includes with his disks.*

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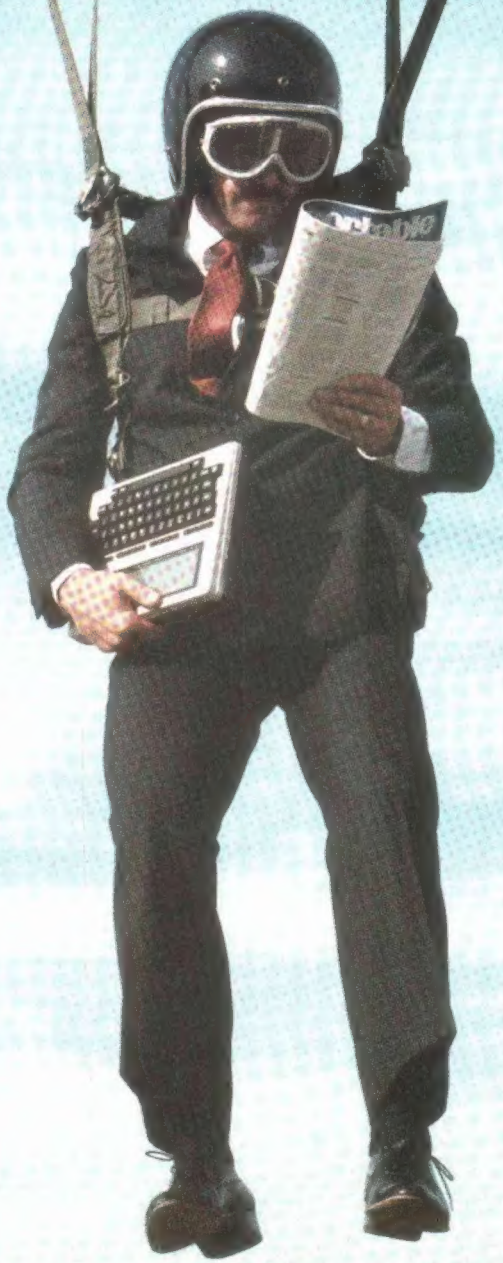

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